

35 CENTS

# CONSTRUCTION

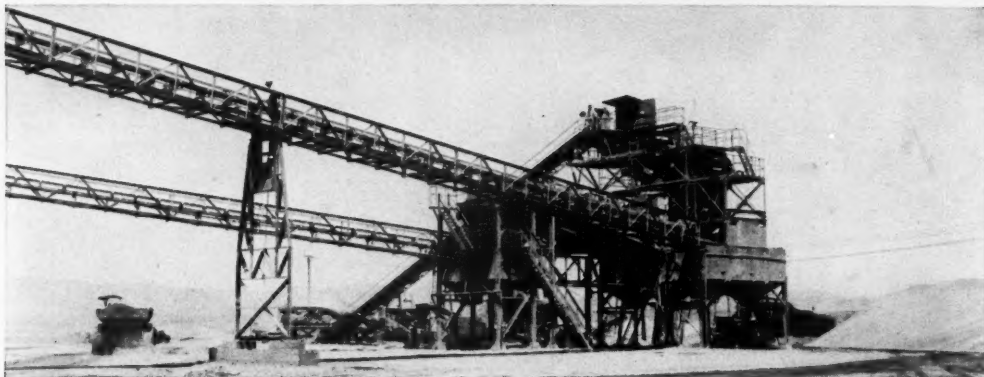
## METHODS AND EQUIPMENT

July 1951



**Equipment Maintenance Number**

A MCGRAW-HILL PUBLICATION



(A) Gravel is processed, and dirt and silt are screened and removed from sand in this washing and classifying plant. From here, the sand and gravel are carried by conveyors to storage piles. Extensive use is made of electric-powered conveyors to provide economical and reliable transportation. G-E motors and control are used throughout the portable arrangement.

## ON JOB AFTER JOB portable plant makes aggregate

*...Electrically*

### G-E Equipment Powers 245-Tons-per-hour Plant to Process Aggregate Wherever It Is Needed.

This portable aggregate and batch plant has now been operated by the Western Contracting Corp. on four projects. Shown here set up near Newman, Calif., to supply aggregate for the Delta-Mendota irrigation canal, the plant has recently been moved to Yuma, Ariz., to do a similar job for the Welton-Mohawk canal. In 1946 the plant was moved 20 miles to the Newman site, set up, and put in operation in 10 days.

General Electric co-ordinated motors and control are used throughout. They give plant operators accurate control of the process, and have cut outages to a minimum. Motors range from 7½-hp G-E Pacific gear-motors driving conveyor belts to a 150-hp rock crusher motor. A 75-hp vertical motor drives a deepwell pump to supply the plant with water.

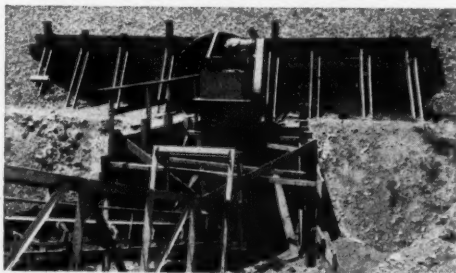
Electrified construction equipment can pay off for you, too. With co-ordinated use of G-E motors and control and G-E power distribution systems you will get safer, more flexible, and more efficient operation. *General Electric Company, Schenectady 5, N. Y.*

*Ask him Today!*

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.



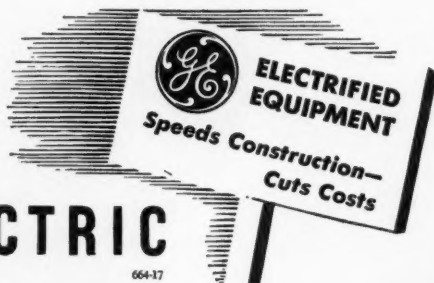
(B) Oversize rocks are removed by this scalping screen at the beginning of the conveyor system. A G-E 20-hp motor operates the screen. Maximum flow of material to the screen comes from an apron feeder operated by a G-E variable speed motor remotely controlled with a rheostat by the operator at the top of the washing plant.



(C) Gravel is drawn from the storage pile by a conveyor powered by a 10-hp G-E Pacific adjustable-speed gear-motor. This drive permits low adjustable speeds, easily changed by a pilot motor which is controlled from the top of the washing plant.

GENERAL  ELECTRIC

664-17





RESEARCH KEEPS

# B.F. Goodrich

FIRST IN RUBBER

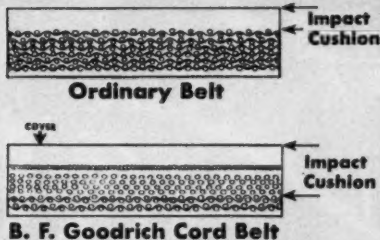
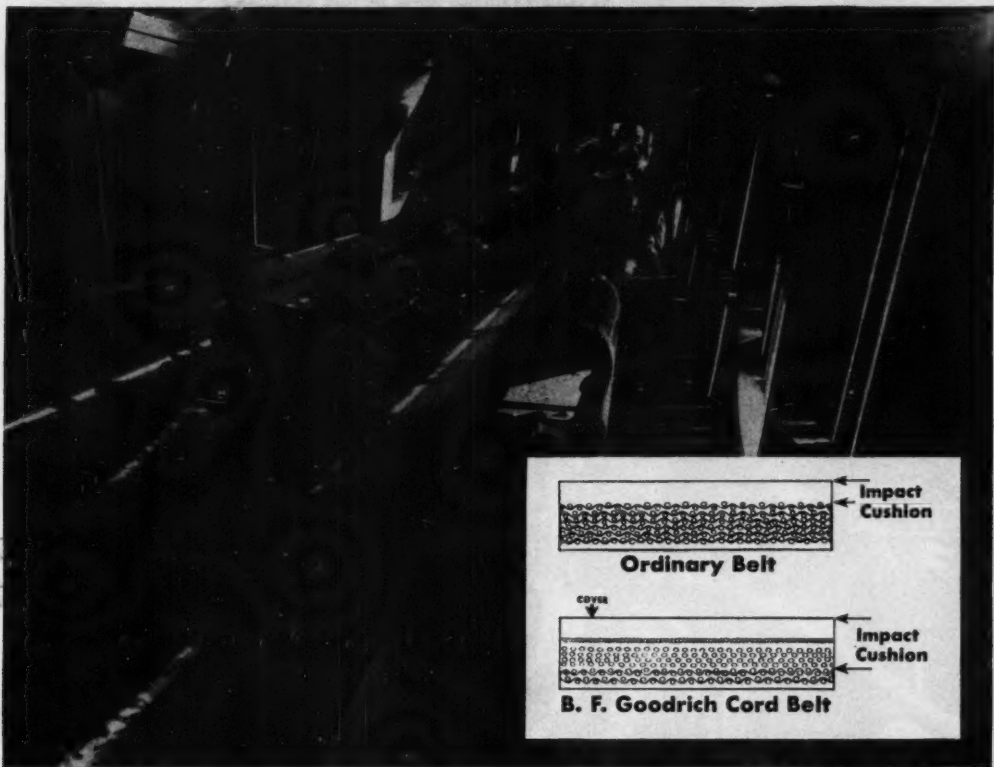


Photo courtesy Bedford Limestone Co.

## B. F. Goodrich cord belt now in its 12th year

### *Gives 2 to 6 times greater impact resistance*

**T**HIS belt carries crushed limestone from a crusher to scalping screens. It was one of the first B. F. Goodrich cord belts ever put into service. Installed in 1939, it replaced an ordinary belt that wore out fast. But the BFG cord belt has carried over 3 million tons of stone, and the limestone company says it still looks good for a lot more service. Here are the reasons for this extra long life:

**Cord belt stands more impact—**Each lengthwise cord in a B. F. Goodrich cord belt is completely surrounded by rubber—no cross threads tie them together. Cords are free to "give" when impact occurs. Rubber distorts

temporarily, distributing and absorbing a shock that would damage stiff, unyielding plies. As an extra protection, B. F. Goodrich has added a patented *Transcord Breaker*—an extra layer of parallel cords in rubber, placed across belt width. Acts as a shock absorber, stretches to prevent gouges and cuts from splitting belt cover.

**Cord belt troughs better—**There being no crossweave in the cord plies, cords are free to flex. Belt conforms to idlers, pulleys. Spillage is reduced, troughing is natural and belt keeps centered on idlers, sustains less damage, requires less maintenance. Longer

centers, higher lifts can be used.

The first B. F. Goodrich cord belt ever made is still on the job after 14 years and 16 million tons of rough-riding coal. If rock, coal, sand, gravel, ore or any other material rough-rides your conveyor, you can save money by calling in your local BFG distributor. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

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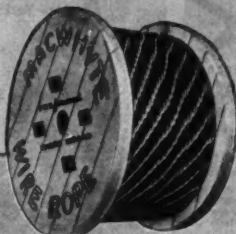
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# CONSTRUCTION METHODS AND EQUIPMENT

Volume 33, Number 7

**JULY 1951**

Established 1919

## Pay Dirt in This Issue

Good Maintenance Paces 25-Mile Tunnel Job .....	46
Amis Believes in Central Shop Maintenance .....	50
Bechtel Depends Upon Distributors for Service and Repair .....	54
Hard-Facing Makes a Name in Contractors' Programs .....	56
Big British Firm Keeps Rigs Rolling With Central Shop .....	60
Navy Rebuilds Wartime Equipment .....	64
Earthmoving—An Art and a Science .....	68
Utility Has an Enormous Equipment Maintenance Job .....	78
Lubrication Keeps Earthmovers Up at Downsville Dam .....	86
Pumps and Vibrators—Forgotten Equipment .....	91
Wire Rope—So What? .....	94
Simple Psychology Saves Cranes .....	103
Hoist Maintenance Can Make or Break a Building Job .....	107
Know Your Oil if You Want Good Equipment Performance .....	112
Tracks or Tires ..... You Can Now Renew the Lugs .....	126
Construction News in Pictures .....	40
Editorial .....	45
The Maintenance Shop .....	123
New Construction Equipment .....	138

## METHODS MEMO and ON THE COVER ..... 194

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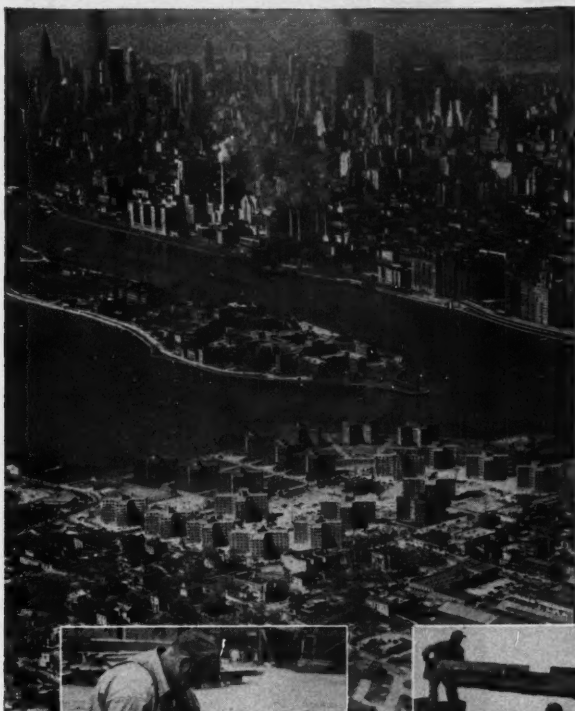
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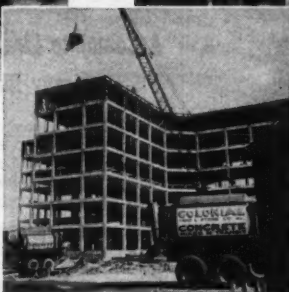
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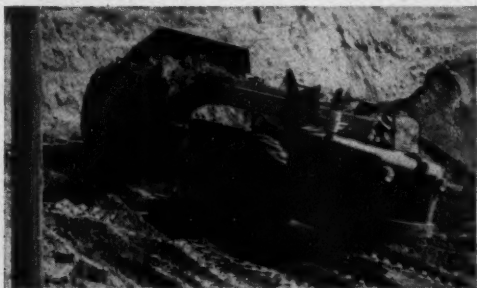
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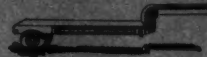
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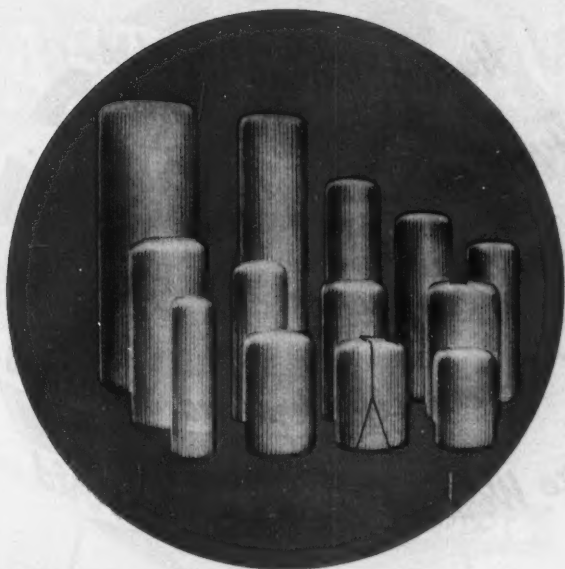


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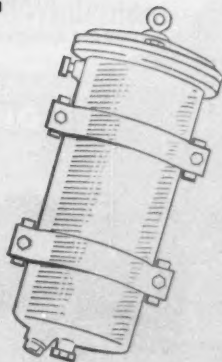
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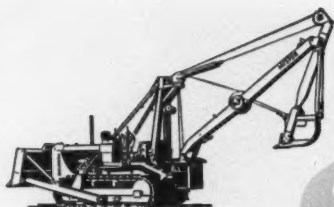
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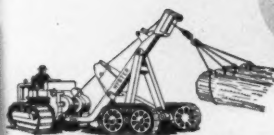
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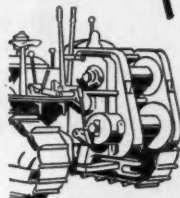


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SCREEDING MACHINE**



**Whiteman  
FLOATING-FINISHING  
MACHINE**

## FLOATING-FINISHING

Complete your efficient concrete operation with the Whiteman Floating-Finishing Machine. Does the work of five men with hand trowels. The Whiteman exclusive, patented "snap-on" float trowels are attached in a few seconds to compact the slab, drive out air pockets, bring up moisture and produce an excellent traction surface. For finishing, remove float trowels and use the tool-and-finish trowel. Pitch of trowels is adjusted by control knob on handle while in operation...an exclusive patented Whiteman feature that is a terrific time saver.

**Whiteman**  
CONCRETE EQUIPMENT

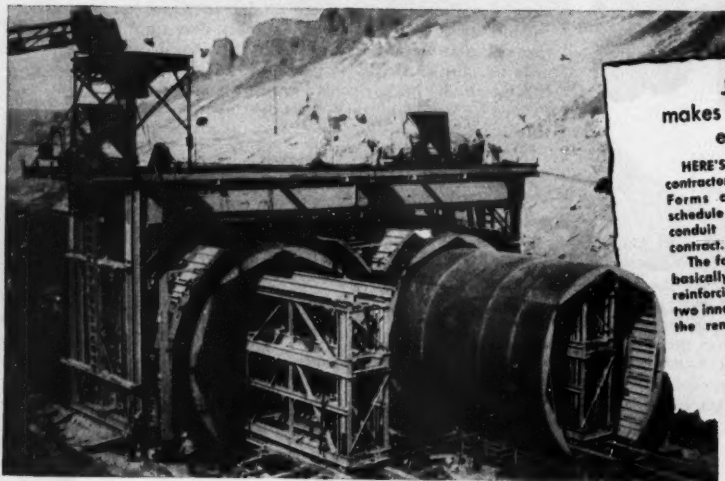
WHITEMAN MANUFACTURING CO.  
3249 Casitas Ave. Dept. C, Los Angeles 39  
Gentlemen: Please send me name of distributor, literature and prices on Whiteman Equipment.

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**MAIL  
TODAY**

# BLAW-KNOX STEEL FORMS

**give double-barreled production  
on GRAND COULEE DAM CONDUITS**



**J. A. Terteling  
makes 25-ft. double pour  
every other day**

HERE'S how J. A. Terteling, Boise contractor, combined Blaw-Knox Steel Forms and a systematic working schedule to make real progress on the conduit section of his Grand Coulee contract.

The form setting procedure consisted basically of first setting the bottom reinforcing steel, then telescoping the two inner barrel forms into place. When the remaining reinforcing steel was placed, the rail-mounted outer form gantry with the outside forms was pulled into place and set for the pour. Sufficient forms were provided to permit concreting a 25-ft. length of double 25-ft. diameter conduit every other day.

**GET these double-barreled Blaw-Knox benefits for your next concrete placing job—First, Blaw-Knox Steel Forms are soundly engineered to keep your job simple . . . to save money by decreasing the number of operations and materials needed. Second, Blaw-Knox offers you an unequalled engineering consultation service to help you cut costs. Blaw-Knox engineers, calling on over 40 years of steel form manufacturing experience, can recommend the most efficient forms for the job, suggest more simplified forming methods, and help you solve any tough or unusual problems from preliminary planning to the final pour.**

## **USE BLAW-KNOX STEEL FORMS AND CONCRETE BUCKETS FOR EVERY CONCRETE PLACING JOB**

Whether your pouring jobs are large or small, simple or tough, call on Blaw-Knox for equipment to do the job faster, better and at lower cost. Send for Bulletin 2035 for special Steel Form design suggestions . . . Bulletin 2070 contains detailed information about the complete line of Blaw-Knox Concrete Buckets. Write for your copies today.



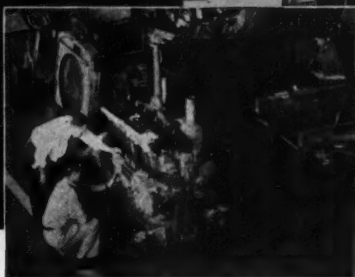
# BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX CO., Farmers Bank Bldg., Pittsburgh 22, Pa.  
New York • Chicago • Philadelphia • Birmingham • Washington • San Francisco



# Your strong right arm...

## in time of need



**B**ECAUSE of the vast defense mobilization program, material shortages and extra production demands have gripped the nation. They affect particularly the heavy industries and the distributors and users of their products. And huge as America's facilities have become in recent years, they still are not large enough to keep pace with both military and civilian needs.

Nevertheless, as an owner of "Caterpillar" products, you are among the more fortunate. Your "Cat" equipment has been built for long life and to withstand severe working conditions. What's more, it is backed by a dealer organization that is world-famous for experience, accessibility, mechanical facilities and field service to keep you going "come hell or high water."

Since World War II, the already large number of "Caterpillar" sales-and-service establishments has increased greatly. Also since that time, "Caterpillar" and its dealers have developed new techniques for restoring and extending the life of "Caterpillar" products. Today, in their own shops, "Caterpillar" dealers can *rebuild* a great many worn or damaged parts which formerly required completely new replacement. In short, every dealer is richly acquainted with scores of modern ways and means for

keeping your machines in good working condition. You can help by doing this:

**Take your maintenance problems to your "Caterpillar" dealer BEFORE parts are worn beyond repair**

Remember that excessively worn parts can cause damage to mating parts; that track parts, pistons and liners, crankshafts, cylinder heads, radiators and other items usually can be salvaged. Your problems are your dealer's problems. Go see him today. He'll do everything in his power to keep your machines operating. Your combined efforts will be reflected in longer equipment life.

**CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS**

# CATERPILLAR

REG. U. S. PAT. OFF.

**DIESEL ENGINES  
TRACTORS  
MOTOR GRADERS  
EARTHMOVING EQUIPMENT**

# MACK TRUCKS

## Get Things Done!

● Extra effort—that's the order of the day as American industry swings into high gear to meet the growing demands of the nation's expanding defense program.

Nowhere is this more important than on vital construction work and on the job of keeping raw materials flowing from the mines, the forests and the oil fields.

Here's work that's cut out for Mack trucks... jobs where big Macks show at their best in *extra* strength and stamina, *extra* performance and *extra* dependability.

Your nearest Mack branch or distributor will show you how Mack's exclusive design and construction can boost output on your particular job... *get things done* faster and at lower cost. You'll find it's a story well worth hearing.



**...outlast them all**

Mack Trucks, Empire State Bldg., New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Model LRSW six-wheel SUPER MACK truck really "gets things done" in strip mining and excavating work—handles its 30-ton loads with round-the-clock dependability.





# FROM ALL OVER THE NATION!

TRACTOR OWNERS ARE ACCLAIMING

**BULLDOG** *Grip-Lug*  
TRACTOR



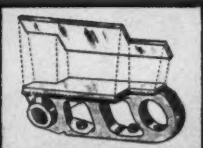
- SAVES DOWN TIME
- INCREASES TRACTOR EFFICIENCY
- GIVES LONGER TRACK WEAR
- LOWERS MAINTENANCE COSTS

and

*Conserves Equipment*

**BULLDOG TRACTOR GRIP-LUG STOPS  
SLIPPING LOSS • FUEL WASTE  
EXPENSIVE DELAYS**

**NEW**

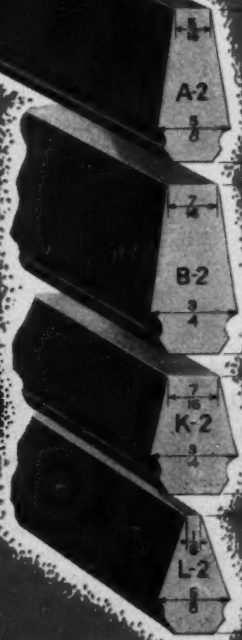


**BULLDOG TRACTOR  
TRAK-LINK**  
*Renu* PLATES

**DON'T DISCARD THE WHOLE SHOE . . .  
. . . ALL YOU NEED IS A NEW SOLE**

- PERMITS QUICK REPAIRS
- COSTS LESS AND WEARS LONGER
- SALVAGES WORN LINKS—SAVES METAL

*Write today for further information about the Complete Line of Bulldog Products  
and the name and location of your nearest dealer.*



SOLE PRODUCERS

**ALLIED STEEL PRODUCTS, INC.**

7835 BROADWAY • CLEVELAND 5, OHIO, U. S. A.

# Weather or not-- **TEXACO MARFAK KEEPS YOUR MAINTENANCE COSTS LOW**

## **ONLY 6 LUBRICANTS NEEDED**

The Texaco Simplified Lubrication Plan for Contractors makes it possible to handle *all* your major lubricating needs with *only six* Texaco Lubricants. A Texaco Lubrication Engineer will gladly give you full information on this convenient cost-saving plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



# TEXACO

**S**OME rain and mud, come blistering heat or freezing cold, *Texaco Marfak stays on the job*. Seals mud and dust out of chassis bearings. Protects against rust. And not even the heavy loads and rough terrain of construction work can jar or squeeze *Texaco Marfak* out of the bearings. No wonder chassis parts last longer, maintenance costs less.

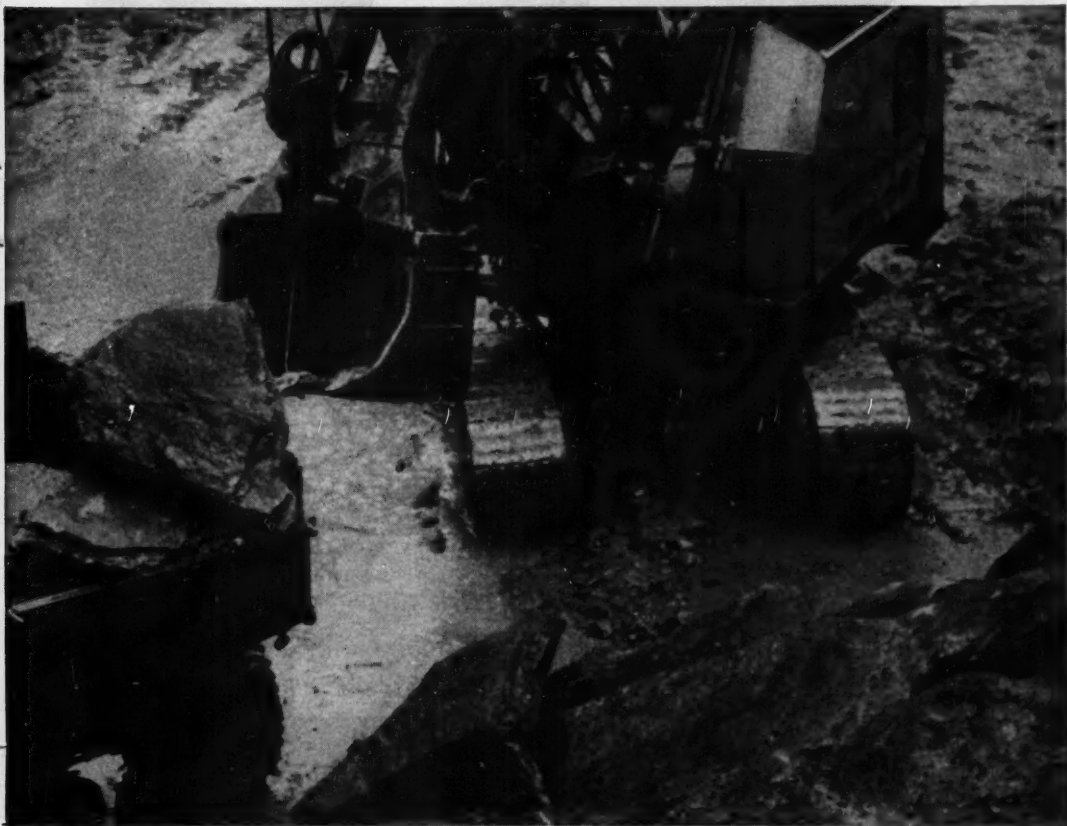
In wheel bearings, *Texaco Marfak Heavy Duty* gives the same long-lasting protection. It guards bearings against wear and rust, and won't leak onto the brakes—an important safety factor. Requires no

seasonal change.

#### **MORE THAN 400 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD**

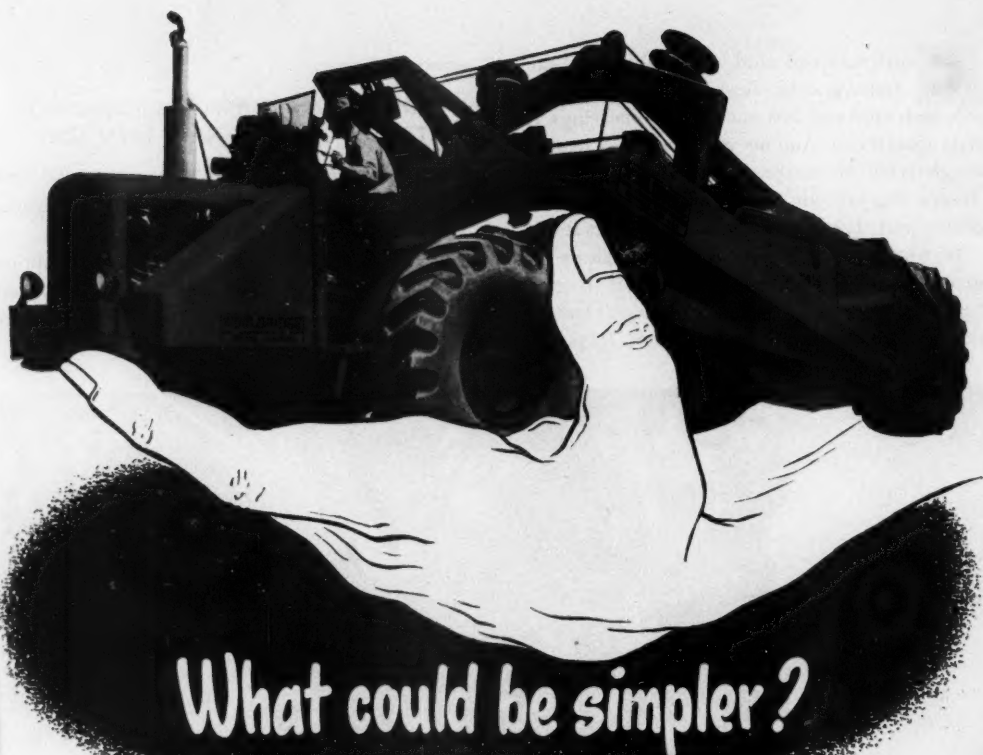
For engine cleanliness, use *Texaco Ursa Oil X\*\**. It's fully detergent and dispersive, guards against harmful sludge and carbon, minimizes wear . . . reduces both maintenance costs and fuel consumption.

To protect crawler track mechanisms, use *Texaco Track Roll Lubricant*. It seals out dirt and moisture, wards off wear and rust.



## **Lubricants and Fuels**

**FOR ALL CONTRACTORS' EQUIPMENT**



Operators, service crews, and the owner who pays the bill . . . all know the importance of simplicity. You can't afford to waste time tearing down unrelated parts every time some component needs service. But can a machine with the high production, speed and ruggedness of the Terra Cobra still be so simple? The men out on the job say that Wooldridge Cobras lick every rig in the dirt on this point. Right in the field, they can get at, lubricate, adjust or remove every important component . . . no fussing with unrelated parts. This accessibility applies to the dependable Cummins diesel, rugged clutch and transmission, heavy duty differential, away-from-dirt power control system, simply reeved cables, and all other functional units. Teamed up with extra

margins of built-in strength, *simplicity* keeps Cobras on the job for more hours of high-profit production — year in and year out. Have your Wooldridge Distributor go over a Cobra with you from bumper to push button, and you'll see what we mean.

**WOOLDRIDGE MANUFACTURING COMPANY**  
Sunnyvale, Calif. • 5345 N. Winthrop Ave., Chicago 40, Ill.

**WOOLDRIDGE**

**BUILT FOR MORE PRODUCTION PER HOUR—MORE HOURS OF PRODUCTION**



YOU CAN'T

**KILL THE**

**LORAIN 820**

**YOU CAN'T  
KILL THE  
ENGINE**

You can't stall the engine under any digging conditions. You can dig the toughest rock and be sure digging power will "hang-on" relentlessly until the most unyielding rock is in the dipper. A Lorain-820 will "murder" rock!

**YOU CAN'T  
KILL THE  
MECHANISM**

Shock and stresses and impacts of heavy rock digging just can't be transferred into mechanism and cables. They "disappear" like magic with the cushion-like action of the Hydraulic Coupling. No "shear pin" safety devices are needed.

**YOU CAN'T  
KILL THE  
OPERATOR**

The operator doesn't fight rock with constant declutching (either manual or automatic)...he opens the engine manifold and lets the "lever-see-die" power crowd the dipper full. "820's" are smooth, steady, with all the "feel" of the old "steamers".

**IN THE TOUGHEST ROCK**

**THE W  
LORAIN.**

Your local Thew-Lorain Distributor can help you solve your rock-digging problems. Ask him for the "820" and Hydraulic Coupling story.

THE THEW SHOVEL CO., LORAIN, OHIO

HERE'S WHAT USERS SAY ABOUT THE DEMPSTER-DIGGSTER—

## "IT'S THE FASTEST, MOST EFFICIENT EXCAVATING TOOL I HAVE USED"

—A. J. METLER, Contractor

"During the past several years," Mr. Metler says, "I have owned and operated four conventional full revolving crawler and truck mounted shovels and cranes and know that they have a direct application to many types of excavating work.

"On the other hand, I have learned that the fast operation of the tricycle mounted Dempster-Diggster permits it to be used on certain types of work to a considerable advantage. Its mobility permits quicker transfer from one job to another.

"I have had excellent results from the Dempster-Diggster and consider it the fastest and most efficient excavating tool I have used."

Mr. Metler is one of the many contractors who has found the Dempster-Diggster to be "the fastest and most efficient excavating tool" available.

This speed and efficiency in excavation work is accounted for, mainly, by the Diggster's exclusive independent hydraulic crowd and hoist action, its hydraulic steering and wheel-type traction.

The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver sensitive, easy, finger-tip control. When accelerated, a one-handed twist of the steering wheel puts the machine in any desired position. By operating on rubber-tired wheels, the Diggster, of course, can move at the fastest possible speed on the job and to and from jobs.



The Type HL Dempster-Diggster is equipped for extraordinary high dumping. The bottom of bucket is 13 feet six inches above ground.



HERE IS THE NEW TYPE HL DEMPSTER-DIGGSTER shown excavating with a  $1\frac{1}{4}$  cu. yd. (heaped) digging bucket. The Type HL Dempster-Diggster will dig through an 18 foot bank while the Type GRD digs through a 15 foot bank.

The Dempster-Diggster is a "must" for contractors, large or small operators alike.

The Dempster-Diggster has a 15 foot turning radius, is 20 feet long when bucket is in traveling position, and is nine feet and six inches in height.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and  $1\frac{1}{4}$  cubic yard (heaped) capacities, and materials handling buckets in  $1\frac{1}{2}$  and 2 cubic yard (struck) capacities.

For fast, efficient operation in difficult terrain, the Diggster is available with crawler-type traction.

"I have not personally used the Dempster-Diggster mounted on crawler treads," Mr. Metler said, "but have seen it in operation on jobs adjacent to mine. I know it is a very effective tool and has many applications."

Construction men have found that on big jobs the Dempster-Diggster has no equal for working in tight places and for freeing big shovels for heavier work. The Diggster has an 8 foot 10 inch crowing reach, will dig through a 15 foot bank, and will dig 15 inches below grade.

Pound for pound, the Dempster-Diggster will out dig and out load any other available competing machine in tough going! Let us prove that statement!

Write today for complete information and prices. The Dempster-Diggster is a product of Dempster Brothers, Inc.



This is the type GRD Dempster-Diggster, which Contractor A. J. Metler considers "the fastest and most efficient excavating tool I have used." It is shown digging 15 inches below grade.

# DEMPSTER DIGGSTER

**DEMPSTER BROTHERS**

371 SHEA BLDG.  
KNOXVILLE 17 TENNESSEE

### PERFECT BALANCE!

Handle is close to center of gravity for good balance. Yet handle-to-blade dimension has been held to a minimum for easy control, greater accuracy.

### ABUNDANT POWER!

Universal motors specially built by Black & Decker for tough power-sawing service. Tops in efficiency, durability and stamina.

### FAST, EASY ADJUSTMENT!

Built-in, easy-to-change depth and bevel adjustments. Two depth adjustments (front and rear) keep handle in comfortable wrist position regardless of depth of cut.



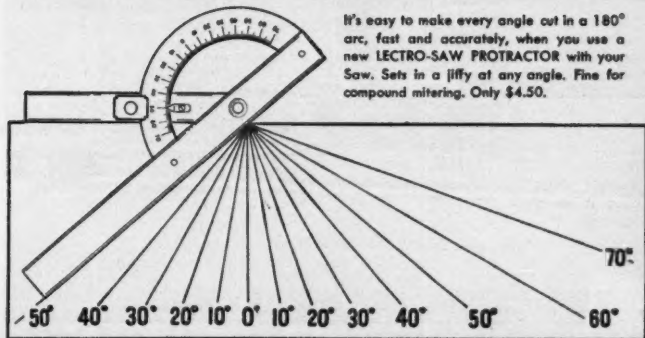
**ELECTRIC LECTRO-SAW SAWS**

*Makes More cuts Many Times Faster!*


8" Heavy-Duty \$92.50  
LECTRO-SAW  
Also 6" Heavy-Duty Deluxe model \$74.50 and 6" Heavy-Duty



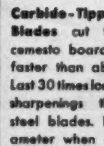
### MAKES MOST CUTS!




### CUTS MANY ANGLES!



**Combination Lectro-Blades** have only 20 or 30 teeth, causing them to cut chips rather than sawdust. Teeth receive less wear, stay sharp longer, give definitely smoother cuts. Seventeen-gage thickness increases cutting efficiency.



**Carbide-Tipped Lectro-Blades** cut granite and cement board 7-12 times faster than abrasive discs. Last 30 times longer between sharpenings than regular steel blades. Lose less diameter when resharpened.



**Abrasive Discs** are of top quality reinforced resinoid type for cutting slate, marble, asbestos, tile, granite, metal, etc.

#### ALSO:

- Planer Lectro-Blades
- Crosscut Lectro-Blades
- Nail Cutting Lectro-Blades

### DRIVES MANY BLADES!



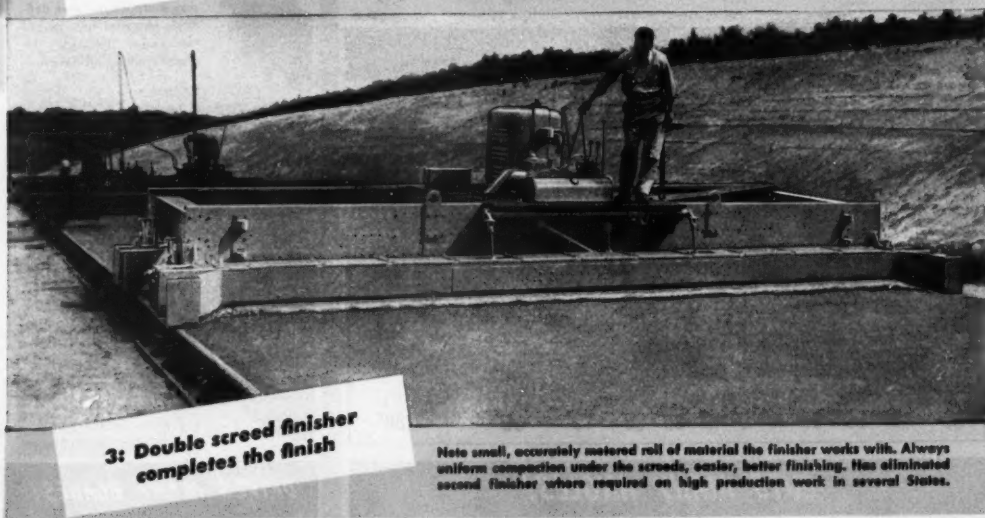
**1: Spreader screw and strike-off do all heavy work**

Screw easily kneds down highest piles, thereby remixes the material as it spreads it form-to-form. Adjustable plate then makes initial strike-off.



**2: Added metering screed then makes precision strike-off**

Note accurately metered surface left by oscillating 12" screed (missing from all other spreaders). No costly carry-back, no high spots. Ideal for finishing.



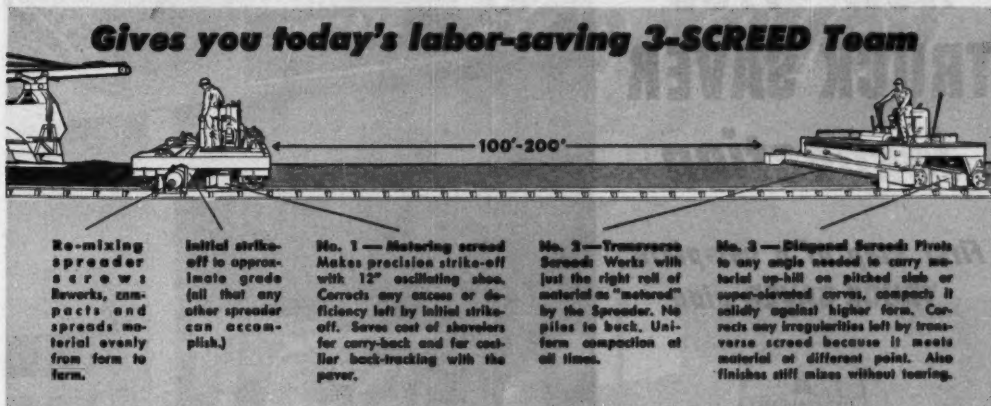
**3: Double screed finisher completes the finish**

Note small, accurately metered roll of material the finisher works with. Always uniform compaction under the screeds, easier, better finishing. Has eliminated second finisher where required on high production work in several States.



# Jaeger locates the missing screed immediately behind your paver

## Gives you today's labor-saving 3-SCREED Team



Note how this 2-machine "team," with its 3 screeds, directly saves labor in front and back of the finisher, maintains steady progress with dual-drum pavers working at capacity and produces uniformly denser,

smoother finished, longer wearing slab. Spreaders and Finishers both built in 10-15, 20-25 ft. widths. Screw-and-Screed Spreader also adaptable for bituminous pavements, including concrete base.



### Jaeger aggregate spreader lays big, low cost tonnage

Costs  $\frac{1}{2}$  the price of bituminous pavers and is better adapted to lay highway and airport base, pave parking lots and many secondary roads. Spreads up to 12" thickness in 10'-11' widths, lesser thicknesses to 12 $\frac{1}{2}$ "—base and surface aggregates, free-flowing hot or cold bituminous mixes or plant-mixed stabilized soil.

Crawler or 4-wheel traction, always on subgrade—no displacing of loose material. Two models to work with any trucks up to 24-ton semi-trailers.



### Jaeger compressors do up to 4 days' work in 3

With Jaeger's 15% to 25% more air you can get 30% to 40% more production with the same men and tools. Model 125, for example, runs 2 heavy breakers at full pressure, breaking up to 40% more yardage than with 105 ft. compressors.

Other "new standard" AIR-PLUS models, delivering 75 to 600 cfm @ 100 lbs. pressure, offer comparable advantages, increase your production by increasing air-power at lowest cost per cu. ft. of air of any compressors on the market.



### Jaeger "Sure Prime" pumps pull stronger, pump longer

Built overseas to produce full rated volume at easy, long-life speeds. Hold more priming water; are less subject to abrasive wear. That's why Jaeger pumps prime without vapor-lock on the toughest pulls, prime fast and sure with two simultaneous priming actions and maintain high efficiency during thousands of hours of added service from both pumps and engine.

Dewatering pumps up to 340,000 gph. Pressure pumps up to 275 psi.

Now is the time to make good use of your Jaeger distributor's service.

## THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio • Distributors in 130 Cities • Cable BIOANLITL

# Now—Free TRUCK SAVER Inspection

*First step of a complete  
TRUCK SAVER plan*



- Available to all International Truck owners
- No cost, no obligation for a 99-point checkup
- For a limited 3-month period ending September 30

Now easily you can keep your Internationals operating at peak efficiency in an uncertain future may depend on what you do within the next 90 days.

If you take advantage of our Truck Saver Inspection, you'll be taking the first step toward putting your Internationals in shape for the "come what may" days ahead.

Since this inspection doesn't cost you a penny, you have everything to gain—nothing to lose. You can save dollars now and perhaps many more before the end of 1951.

So get ready now to keep your trucks on the job despite shortages. The sooner you get your free Truck Saver Inspection, the sooner you see practical reasons why you should take advantage of our complete International Truck Saver Plan.

## Look what the complete International Truck Saver Plan offers

The complete International Truck Saver Plan has been developed by experts, after a thorough study of today's truck operating problems. It offers these benefits to International Truck operators:

1. **Better performance** over a longer truck life: trucks are kept in shape to do the most efficient job possible until they can be replaced by new units.
2. **Delays minimized** in getting new parts: by anticipating future requirements, the demand for needed parts can be accurately estimated.
3. **Maintenance costs cut**, down time reduced: by preventing major breakdowns, a big saving is effected in both time and money.

4. **Truck value maintained**: trucks kept in the best possible condition are worth more when it's time for replacement.

## Take advantage of the International Truck Saver Plan now

If you want to save yourself trouble and money in the months ahead, you belong in the International Truck Saver Plan.

Get your free Truck Saver Inspection—find out from your International Truck Dealer or Branch how the plan can help you keep your Internationals going at peak efficiency.

International Harvester Builds  
McCormick Farm Equipment and Farmall  
Tractors . . . Motor Trucks  
Industrial Power . . . Refrigerators and Freezers



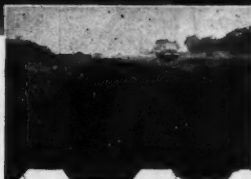
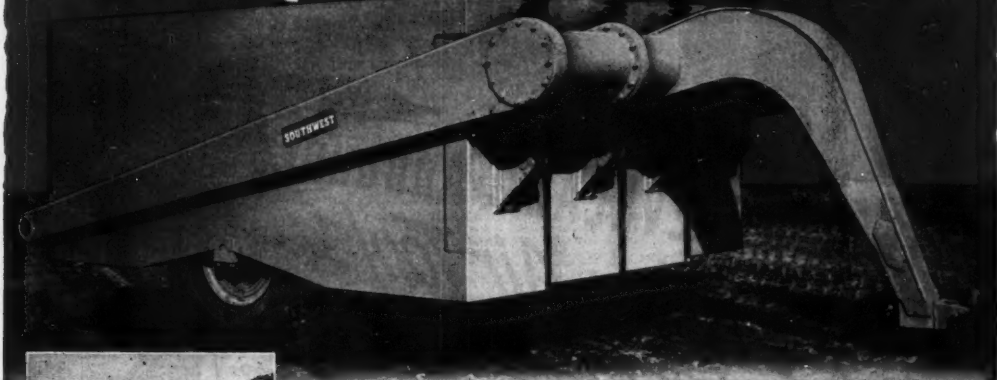
International Harvester Company • Chicago



# INTERNATIONAL TRUCKS

*Heavy-duty engineered for the long haul*

# SOUTHWEST *Compaction Roller*



Note how every print of each tire tread is uniform in depth and shape.

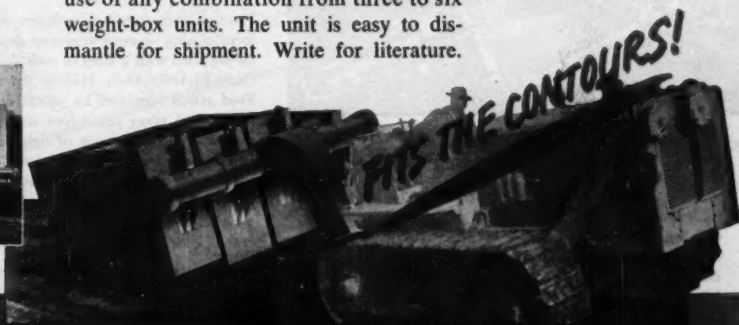
The weight-box units are hinged at the rear and oscillate independently.



## For compacting earth fills!

UNEVEN GROUND CONTOURS cannot reduce the efficiency of the new Southwest Compaction Roller. As it travels over the variable surface of the earth fill each weight-box unit with its own wheel and tire oscillates independently up and down. Compaction is positively uniform because the weight on each tire remains constant—there is no bridging and no sudden shifting of load from tire to tire.

The sectionalized tubular yoke permits the use of any combination from three to six weight-box units. The unit is easy to dismantle for shipment. Write for literature.



CONSTRUCTION MACHINERY DIVISION

**Southwest Welding & Manufacturing Co.**

*Alhambra, California*

HAULING SCOOPS

BULLDOZERS

LOADERS

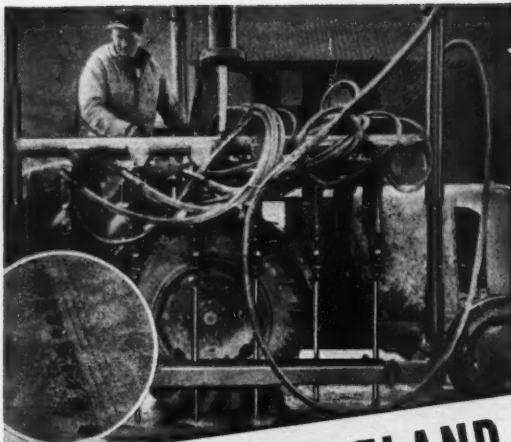
BOTTOM DUMP WAGONS

RIPPERS

TAMPERS

SCRAPERS

TREE DOZERS



1

## Multiple Drill Rig for Line-drilling

This self-propelled rig has saved hundreds of dollars for contractors everywhere. It consists of 6 Le Roi-CLEVELAND H10 drills mounted on a Le Roi Centaur Tractor. All drills are attached to a single air cylinder controlled from the driver's seat, and feed into the concrete or pavement together. The rig is ideal for line-drilling and the web between the drill holes can be broached easily with Le Roi-CLEVELAND paving breakers. That's how it provides a fast, low-cost method of preparing pavement for trenching. Freedom from over-break permits clean, smooth resurfacing when job is finished.

# Le Roi-CLEVELAND Announces 3 New Air Tools for Contractors

...they save work, cut costs, and help keep jobs on schedule



3

## 18-lb. H22 Hornet Rock Drill

Handy is the word for this new tool. Available with spade or tee handle in wet or dry types. Fast drilling, easy holding, strong rotation, low air consumption, built-in lubricator, replaceable spacer bushing, 2-piece chuck and sleeve for  $\frac{7}{8}$ " hex x  $3\frac{1}{4}$ " steel. Built like a big rock drill. Ideal for foundations, demolition, plumbing, sewers, conduit, pop-holing, dimension stone, etc.



Hand crank or . . .



... air motor for fast, easy adjustments

2

## Model DR34 Light Wagon Drill

Here's a truly lightweight wagon drill. It's ideal for quarries, road jobs, mining — every highway department should have one. Can be supplied with 2 sizes of rock drills — either the famous Le Roi-CLEVELAND 45-lb. H10 or the 80-lb. H23 with  $3\frac{1}{8}$ -inch bore. Feed action furnished by patented 2-in-1 air feed cylinder. 7-foot feed travel gives you 6-foot steel changes. Conveniently located controls permit selection of right feed pressure for highest drilling speed in any kind of rock. Strong, direct blowing easily cleans 20-foot holes. You can drill at practically any angle — toe holes with machine 4 inches from ground or flat holes  $7\frac{1}{2}$  feet from the ground. Adjustments are easily and quickly made by either hand crank or air motor.

No matter what your drilling job is — you can do it better, faster, for less with Le Roi-CLEVELAND rock drills and breakers powered with Le Roi Airmaster Compressors. Write for complete information or see your nearby Le Roi distributor.

RD-41



# LE ROI COMPANY

CLEVELAND ROCK DRILL DIVISION

12500 Berea Road, Cleveland 11, Ohio

Plants: Milwaukee • Cleveland • Greenwich, Ohio

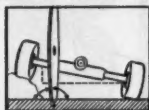


# SAW CONCRETE OR ASPHALT WITH AMAZING

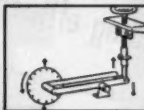
## Clipper® CONCRETE SAWS

Saw 12 feet per minute in Asphalt or 5 feet per minute, 1 inch deep, in cured limestone Concrete. With Clipper you can saw up to 6½ inches deep. Concrete Sawing is Practical and Profitable because Clipper Concrete Saws are Built with the experience of World's Largest Manufacturer of Masonry Saws.

### Experience Proves A Concrete Saw Must Have These Clipper Features:



**1. Clipper "No Bind"**  
Floating Three Point Suspension Automatically protects blade.



**2. Positive Screw Feed**  
Instant control raises or lowers blade smooth, easy.



**3. Adjustable Depth Lock**  
Set this handy stop for whatever depth desired.



**4. Patented Spray Control**  
Its value is measured in increased Blade Life.

**Model C-130**  
Power Packed

4 wheel — Perfect Control, tips back and turns on a dime.

### THREE ENTIRELY NEW MODELS FAST—EFFICIENT—ECONOMICAL

Clipper Concrete Saws **CUT** through the toughest concrete, wherever patches, trenches, openings or contraction joints are needed.

#### SAW BEFORE YOU BREAK...

Eliminate radial cracks. Stop spalling. Have perfect jobs. Architects, Consulting Engineers, City and State Engineers are solving their problems by specifying "Saw before Breaking".

Utility Companies enjoy lower costs while improving Public Relations. Concrete Contractors praise the ease of getting the tough job done with new found profits!

Patent Numbers 2538318, 2468113, 2470984—  
Other Patents Pending—Printed in U.S.A.

### GENUINE CLIPPER DIAMOND BLADES

Regardless of the Material you plan to Cut... Limestone, Flint, Gravel, Aggregate Concrete Green or Well Cured, or Asphalt... there's a Clipper Diamond Blade to cut fast and economically.

#### TRENCH

Gas, Water, Sewer, Electric, Telephone, new installations or old ones repaired



#### PATCH

Saw clean straight lines, break smooth—Size and shape make no difference



#### CONTRACTION JOINTS

Highways, Streets, or Building Floors precision cuts eliminate hand tooling



#### POLES

Installing new City lights? Clipper Concrete Saws prevent radial cracks



#### DRIVES—WALKS

Prove the job can be small and still make concrete sawing profitable



### YOU CAN'T BEAT A CLIPPER

Here's the guarantee that has gone with every Clipper for more than 12 years to Prove it!

"Guaranteed to Provide Faster Cuts, with Lower Cost, with Greater Ease Anytime, Anyplace"

#### DON'T DELAY—WRITE TODAY

Completely descriptive literature tells the value of Clipper Concrete Saws. Get this information now! Tell us what you plan to cut!

Serving the World as the World's Largest Manufacturer of Masonry Saws



**Clipper**  
NATION-WIDE DIRECT FACTORY SERVICE  
**MANUFACTURING CO.**  
KANSAS CITY 8, MISSOURI  
Cable Address: CLIPPER K C MO

PITTSBURGH • ST. LOUIS • NEW YORK • WASHINGTON, D.C.  
SAN FRANCISCO • CHICAGO • CLEVELAND • PHILADELPHIA  
AUSTIN, TEX. • DETROIT • CINCINNATI • ATLANTA • BOSTON

### SOLD ONLY DIRECT FROM CLIPPER FACTORY BRANCHES

#### FREE TRIAL

You Can Test—Actually Try A Clipper Concrete Saw On Your Job Without Obligation. It's Your Guarantee Of Perfect Performance.

MAIL COUPON NOW... for full details on.....  
**FREE TRIAL**

#### CLIPPER MANUFACTURING CO.

CONCRETE SAW DIVISION 2C

2809 W. WARWICK • KANSAS CITY 8, MO.

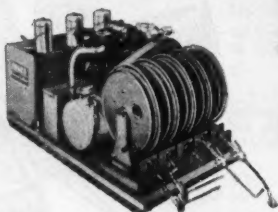
Send FREE—literature, information, and prices on the NEW—CLIPPER CONCRETE SAWS

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

**PROVED!**  
on thousands of construction jobs  
**IMPROVED!**  
with great new features in design  
and operating efficiency

**new**

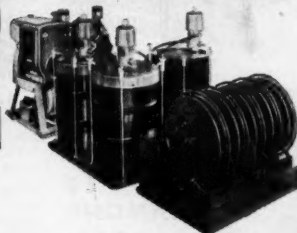
**BUY  
EITHER  
WAY**



**SELF-CONTAINED CONVOY LUBER**

**—READY TO USE**

● The grease rig that goes to work immediately! Completely self-contained, this ConvoY Lubr model is skid-mounted. Just slide it on truck or trailer and go to work. Has hose reels for grease, oil and air; powerful high volume pumps; a tool box and all the other parts and fixtures you'll ever need. The new Graco catalog tells all about this unit, and what it can do for you.



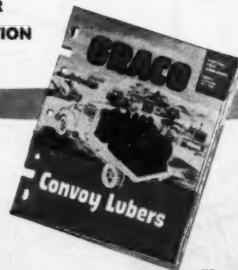
**JOB-PLANNED CONVOY LUBER**

**—EXACTLY AS YOU WANT IT**

● A build-your-own unit, planned by you to give your equipment the very best greasing care. Any combination of pumps, reels and other equipment you want, depending on your needs. Charts in Graco's new ConvoY Lubr catalog help make your selection of the component parts even easier ... give you specific suggestions on how to assemble the best rig to fit any condition. Available with or without air compressors.

**WRITE TODAY!**

**NEW 24-PAGE CATALOG FOR  
CONTRACTORS AND CONSTRUCTION  
MACHINERY DISTRIBUTORS**



**GRACO** **ConvoY Lubers**

**Keep costs down ... keep yardage up!**

# on-the-job **LUBE RIG**



## **"Most important rig on the job!"**

**W**HEN improper greasing causes costly breakdowns, any man on the job is ready to admit the importance of good greasing equipment. But don't wait until that breakdown comes along! Put a Graco Convoy Luber to work now and you'll enjoy the closest thing to a non-stop work schedule... with never a slip-up due to lubricating failures.

Graco Convoy Lubers have passed the roughest tests... construction work with the U. S. Engineers, big-scale jobs with the Seabees, and hundreds of important civilian projects. And today, Convoy Lubers are heavy-

duty, fast-operating, efficient rigs that will do more jobs than ever... better than ever.

Big feature of the new Convoy Luber is the new heavy-duty Powerflo pump... the pump that works around the clock, day after day, without breakdown. Convoy Luber pumps handle the stiffest grease... deliver faster... assure more thorough greasing. Pumps operate either in original drums or in hoppers.

Graco Convoy Lubers outperform makeshift lubricating equipment by a wide margin... give you additional savings in money and man-hours.

## **GRAY COMPANY, INC.**

**78 GRACO SQUARE  
MINNEAPOLIS 13, MINNESOTA**

District Offices in  
New York,  
Philadelphia,  
Chicago,  
Detroit,  
San Francisco.

# MIXERMOBILE MANUFACTURERS completely *Portable* CONCRETE

- WEIGH BATCHING
- MIXING
- ELEVATING **PLANT**

**CAPACITY UP TO 50 CU. YDS. PER HOUR**

## FROM RAW MATERIALS TO POURED CONCRETE

This ruggedly built trio means more jobs covered...reduced labor costs...savings in time and expense of making stationary installations. All functions are performed by one operator on each unit. Completely portable equipment travels at normal highway speeds...setup time for complete operation is 15 minutes or less.



### MIXERMOBILE WEIGH BATCHER • Model WB-1

Completely portable unit weigh batches aggregate on the job. Can be charged with front end loader from storage piles or directly from dump trucks. Single operator sets up unit for operation in 15 minutes. Weigh batches up to 50 cu. yds. per hour.

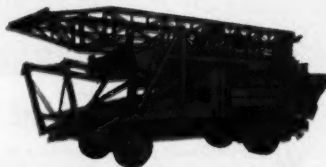
- Three 7 cu. yd. bins and 2 cu. yd. skip store up to 23 cu. yds. of aggregate.
- Charging skip hydraulically operated.
- Bin selector located by skip control directs skip.
- Equipped with either dial or beam scales.
- Weight, 17,800 lbs; height, 12 ft.; width, 8 ft.; overall length, 28 ft. (with skip down).
- Mounted all around on 8.25x20 tires.



### 2-YD. MIXERMOBILE • Model M-7

Completely mobile concrete mixing and elevating plant eliminates cost of hauling and erecting expensive equipment. One man handles the entire operation from mixer to deck.

- Improved batch-timer and counter insures positive mixing time.
- New electronic water meter gives unerring accuracy.
- Sturdy planetary drive hoist clutches give extra power, durability.
- Mixes up to 50 cu. yds. per hour.



**SCOOPMOBILE • Model C.** The versatile Scoopmobile with exclusive planetary drive has 7 "quick change" attachments. Standard  $\frac{3}{4}$ -cu. yd. scoop bucket permits operator to keep Weigh Batcher unit performing to full capacity.

- Loads and transports aggregate.
- Lifts and places form panels, timbers, etc., up to 4,000 lbs. capacity.
- Transports, elevates and pours concrete.

**ATTACHMENTS INCLUDE:** Scoop buckets in various sizes, swivel and standard type concrete hoppers in  $\frac{3}{4}$  cu. yd. capacities, lift forks, crane boom, track extensions with braces up to 26 feet overall.



Write for literature and address of your nearest dealer.

Mixermobile Manufacturers reserve the right to make improvements in design and specifications without notice.

## MIXERMOBILE MANUFACTURERS



Box 7527

Portland 20, Oregon



**For prompt service on the job, at your shops,  
or at nearby service headquarters,**

# *See Your* **LeTOURNEAU DISTRIBUTOR**

***Maintenance*** . . . skilled mechanics, factory trained, have personal interest in long-life performance of your equipment. On every call they help train operators and mechanics in preventive maintenance.

***Parts*** . . . large stocks provide prompt deliveries of precision, factory-made parts. On all his lines, your LeTourneau Distributor is the best source of supply to protect you against future wartime shortages.

***Rebuilding*** . . . you get "good-as-new" service, delivery as promised, all work guaranteed. Estimates cheerfully furnished. Please cooperate by scheduling work as far in advance as possible.

***Accessories*** . . . all top quality items . . . attachments and interchangeable hauled units for LeTourneau and other prime movers. Also cabs, lighting equipment, heaters, seats, safety items, cable cutters, etc.

***Supplies*** . . . Tournarope (with more steel and strength per foot), big tire replacement and retreading, batteries, oil filters, air cleaners, spark plugs, brake linings, cable clips, welding rods, lubricants, etc.

***Used Equipment*** . . . quality "buys," backed by a long-time interest in customer-distributor relationship. Every piece of equipment carefully checked and history and condition fully and frankly described. We are always especially interested in locating buyers for used crawler equipment.

LETOURNEAU



EQUIPMENT

See Next Page

# Longer Life

## FOR YOUR EQUIPMENT

In these troubled times, long-life equipment is of vital interest to you in planning for the future. We have always cooperated in helping you get long-time profits from your LeTourneau equipment... are now making extra effort to help you conserve machine investment in the period ahead. Both we at LeTourneau and our Distributors feel pride and responsibility for the machines that carry our name. So... the sale of a piece of equipment is not the conclusion of our effort... it is only the beginning of our cooperation with you.

Your local LeTourneau Distributor and his experienced staff of engineers and mechanics, believe with us that our sales responsibility consists of: (A) putting the right tool on the right job; (B) helping the owner and operator obtain maximum production with it; and (C) supplying courteous and prompt service to prolong the lifetime of every LeTourneau unit in the field. This system of close cooperation from factory and Distributor is assured through the personalized services explained on these pages.

Whenever you need help in setting up preventive maintenance programs, or for prompt parts, shop or field repair service, be sure to call your local LeTourneau Distributor. Owner or not, also see him for expert engineering counsel in the planning and operation of earthmoving projects. You will find him highly qualified to serve you—conscientious, impartial, ready to make recommendations to your best interest. He's a good friend to know!

**R. G. LeTourneau, Inc.**  
Peoria, Illinois, U.S.A.



# 1

### Equipment Experts CHECK DELIVERY

Upon arrival of new equipment at the job, your LeTourneau Distributor rechecks our factory service experts by making a thorough inspection and test of every LeTourneau machine to make sure that it is delivered to you in A-1 condition. They want to insure that you get full benefit from all advantages of this high-speed, precision machinery... to be doubly sure these units are ready to fulfill every possibility they offer you for lowest-net-cost-per-yard operation for many years to come.



# 4

### Prompt Service WHEREVER YOU GO

Adequate stocks of genuine parts, prompt delivery, and efficient shop and field service facilities are major obligations of your LeTourneau Distributor. You can count on his entire organization for prompt and courteous service. We both realize your goodwill, and our reputation, depend on satisfactory performance of every machine that carries our name. So, regardless of age of equipment, or location of future jobs, you can always count on us for dependable service, anytime, anywhere.

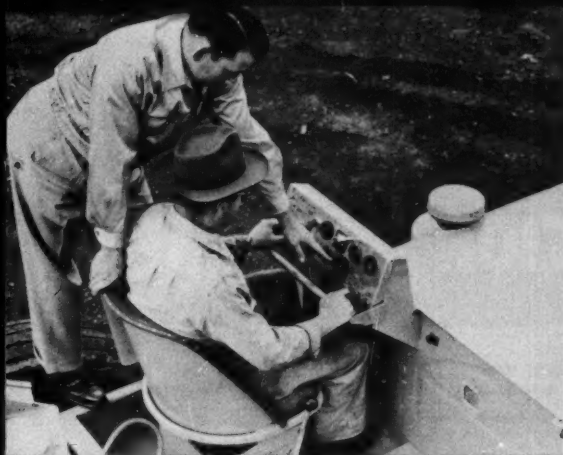


**TOURNADOZERS\***

**TOURNAPULLS\***

*Factories at:* Peoria, Illinois; Toccoa, Georgia; Vicksburg, Miss.; Longview, Texas; Rydalmere, N.S.W. Australia

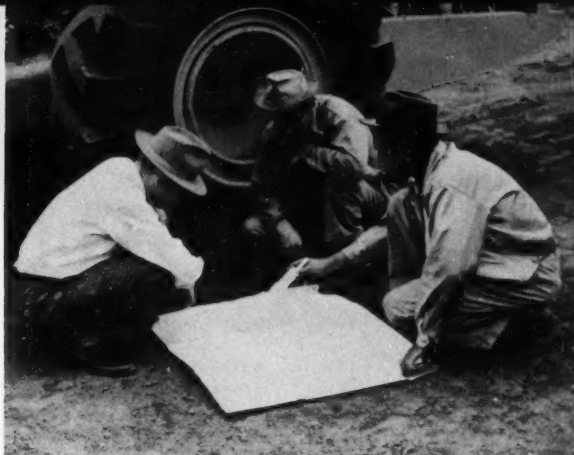
Complete line of excavating, hauling and lifting equipment



# 2

## **Demonstrators INSTRUCT YOUR OPERATORS**

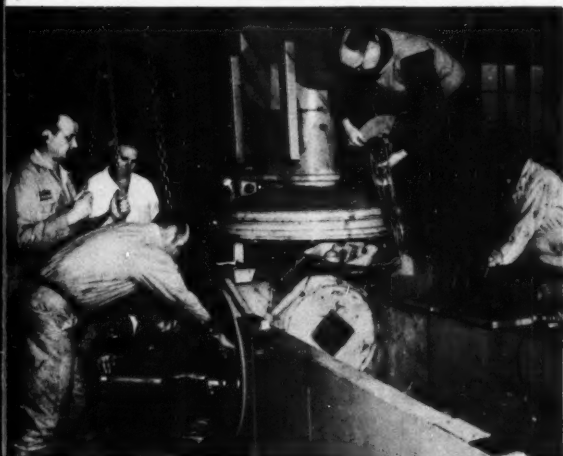
To further assure you long-life efficiency plus maximum production from your machines, factory-trained Distributor men give your staff practical, first-hand instruction on correct care and operation of equipment. They also help you set up proper lubrication, service, and preventive maintenance schedules. New electric controls are so extremely simple that, with the help of these distributor demonstrators, old or new operators can be quickly trained for big output and low cost upkeep.



# 3

## **Application Counsel ON-THE-JOB**

After the sale, cooperation extends out into the field, onto the job, where Distributor and LeTourneau engineers help plan haul routes, cut and fill areas, and assist in establishing overall job planning for the most efficient application of this high-speed, rubber-tired excavating equipment. We are as interested as you are in making our equipment last longer . . . work more profitably for you . . . we want your repeat orders through the years to come . . . and the good opinion of your friends.



# 5

## **Distributor Staff FACTORY-TRAINED**

At LeTourneau factories, Distributor personnel learn the latest methods and equipment by working on actual machines. Factory schools are operated year round and refresher courses given in traveling schools to keep mechanics and field engineers constantly up-to-date. These LeTourneau-trained Distributor men assure top-quality service in the field. Distributors cooperate fully in this extensive training because they know how much our long-life, low-cost performance means in future sales.



# 6

## **Field Engineers HELP PLAN PROJECTS**

Both your LeTourneau Distributor and company field engineers are always available to help study your project requirements. They will be glad to help you analyze costs based on use of old and new equipment, and to suggest, impartially, the most efficient methods of getting work done at lowest cost. Their object is solely to help you make maximum profits because helping our friends has always paid us dividends in permanent customers. There is no obligation whatever for this service.



**TOURNAROCKERS\*\***



**TOURNAHOPPERS\*\***



**CARRYALL\* SCRAPERS**

LETOURNEAU



for use with high-speed, rubber-tired prime movers and with all standard crawling tractors.

# For Top Service

## on CONSTRUCTION EQUIPMENT

### ALABAMA

Miller G. Williams Machinery Co.  
MONTGOMERY  
BIRMINGHAM

### ARIZONA

Arizona Equipment Sales, Inc.  
PHOENIX

### CALIFORNIA

Cook Company  
LOS ANGELES  
BAKERSFIELD  
Capital Tractor & Equip. Co.  
SACRAMENTO

### COLORADO

The Colorado Builders' Supply Co.  
DENVER

### CONNECTICUT

The Rosen-Leahy Co.  
HARTFORD

### DELAWARE

General Supply & Equip. Co., Inc.  
BALTIMORE, MD.

### DISTRICT OF COLUMBIA

General Supply & Equip. Co., Inc.  
BALTIMORE, MD.

### FLORIDA

Florida Equipment Co. of  
JACKSONVILLE  
MIAMI  
TAMPA

### GEORGIA

Black Machinery & Equip. Co.  
ATLANTA  
ALBANY

### IDAHO

J. N. Wheeler Machinery Co.  
POCATELLO

### ILLINOIS

Illinois Contractors' Machy., Inc.  
MELROSE PARK  
EAST PEORIA

### INDIANA

Stockberger-Seastrom, Inc.  
FT. WAYNE  
INDIANAPOLIS

### IOWA

James W. Bell Company, Inc.  
CEDAR RAPIDS  
DES MOINES

### KANSAS

The Victor L. Phillips Co.  
WICHITA

### KENTUCKY

Wilson Machinery & Supply Co.  
LEXINGTON  
PADUCAH

### LOUISIANA

E. C. Ray Machinery Co.  
BOSSIER CITY

### MAINE

Parker-Danner Co.  
AUGUSTA

### MARYLAND

General Supply & Equip. Co., Inc.  
BALTIMORE

### MASSACHUSETTS

Parker-Danner Co.  
HYDE PARK  
NEWTON HIGHLANDS

### MICHIGAN

Contractors' Machinery Co.  
GRAND RAPIDS  
DETROIT  
Straits Engineering Co., Inc.  
SAULT STE. MARIE

### MINNESOTA

Phillips-Murphy Equipment Co.  
MINNEAPOLIS  
HIBBING

### MISSISSIPPI

Watkins-Aldridge Equipment Co., Inc.  
JACKSON

### MISSOURI

The Victor L. Phillips Co.  
KANSAS CITY  
O. B. Avery Co.  
ST. LOUIS

### MONTANA

Montana Powder & Equipment Co.  
HELENA  
BILLINGS

### NEVADA

Sierra Machinery Co.  
RENO

### NEW HAMPSHIRE

Parker-Danner Co.  
MANCHESTER

### NEW JERSEY

Jaeger-Lumbo Machine Corp. of N. J.  
SPRINGFIELD

### NEW MEXICO

Contractors' Equipment & Supply Co.  
ALBUQUERQUE

### NEW YORK

Harrod Equipment Co., Inc.  
SYRACUSE  
Rupp Equipment Company  
BUFFALO  
ROCHESTER  
The Jaeger-Lumbo Machine Corp.  
FLUSHING, L. I.

### NORTH CAROLINA

Mitchell Distributing Co., Inc.  
SPRUCE PINE  
RALEIGH

### NORTH DAKOTA

Smith, Inc.  
FARGO

### OHIO

Gibson-Stewart Company  
CLEVELAND  
COLUMBUS

### OKLAHOMA

Kessler-Simon Machinery Co.  
OKLAHOMA CITY

### OREGON

Loggers & Contractors Machy. Co., Inc.  
PORTLAND  
EUGENE

### PENNSYLVANIA

Dravo-Doyle Company  
PITTSBURGH  
Furness Machinery Co.  
PHILADELPHIA  
HARRISBURG  
NEW PHILADELPHIA

### RHODE ISLAND

Parker-Danner Co.  
PROVIDENCE

### TENNESSEE

Dempster Brothers, Inc.  
KNOXVILLE  
NASHVILLE  
CHATTANOOGA  
Tri-State Equipment Co., Inc.  
MEMPHIS

### TEXAS

Contractors' Equip. & Supply Co. of  
EL PASO  
J. E. Ingram Equipment Co.  
SAN ANTONIO  
EDINBURG  
CORPUS CHRISTI  
Berry Bros. Machy. Co.  
DALLAS

### UTAH

J. N. Wheeler Machinery Co.  
SALT LAKE CITY

### WASHINGTON

Modern Machinery Co., Inc.  
SPOKANE

### WEST VIRGINIA

Baldwin Machinery Co., Inc.  
CHARLESTON  
CLARKSBURG

### WISCONSIN

Miller, Bradford & Wisberg Co.  
EAU CLAIRE  
MADISON

### WYOMING

The Colorado Builders' Supply Co.  
CASPER

### Canadian Distributors

### ALBERTA

Costello Equipment Co., Ltd.  
CALGARY  
EDMONTON

### BRITISH COLUMBIA

Vancouver Equipment Corp., Ltd.  
VANCOUVER

### MANITOBA

Prairie Equipment & Radiators, Ltd.  
WINNIPEG

### ONTARIO

The General Supply Co. of Canada, Ltd.  
OTTAWA  
ISLINGTON

### QUEBEC

The General Supply Co. of Canada, Ltd.  
MONTREAL

### SASKATCHEWAN

Contractors Supplies Limited  
REGINA

### LETOURNEAU



EQUIPMENT

# Your LeTourneau Distributor



# FOR LARGER PROFITS and BETTER RESULTS IN EVERY PHASE OF CONCRETE PAVING!

## HIGHWAY and AIRPORT

### JACKSON VIBRATORY PAYING TUBE

The JACKSON Paving Tube, which is quickly attached to any standard finisher, provides full width internal vibration through full depth of the slab. The harsher mixes are readily made plastic. Important savings in cement can be made, or important gains in compressive strength and durability achieved when no cement reduction is made. Spreading costs are reduced, finishing progress is much more rapid, complete compaction is accomplished and concrete is perfectly puddled at side-forms and joints. It is adaptable to slabs 6" to 24" thick and quickly adjustable from 10' to 25' widths, in the field. May also be attached to standard spreaders for vibrating the first course in thick slab construction. Write for complete details.

### JACKSON SIDE FORM VIBRATOR

Eliminates manual vibrating of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher, Jackson Vibratory Paving Tube or Spreader. Employs two or more vibratory units which are simultaneously lowered into or raised from the concrete by the finisher operator. Units operate close to forms or reinforcement, ride over any obstruction without fouling. Will not penetrate into sub-base. Assures thorough compaction regardless of speed of finisher, no spots missed. Long-wearing, trouble-free. Write for complete facts.

## MUNICIPAL PAVING - BRIDGE DECKS HIGHWAY WIDENING and PATCHING, etc.

### JACKSON VIBRATORY SCREED

Strikes off to any crown, undercuts at curb or side-form, works right up to and around manholes and other obstructions. With it center joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant. Most productive, most versatile of all screeds. Write for details.

**VIBRATORS for every type of concrete construction FOR SALE or RENT at your Jackson Distributor.**

ELECTRIC TAMPER & EQUIPMENT CO.  
LUDINGTON - - - MICH.

You didn't buy it  
 the supplier didn't sell it  
 but OCS\* is present in  
 every conventional belt!

## **ROTOCURE Eliminates** **this major cause of Belt Failure**

\* Overcured Sections—present every 30' to 40' in all belts made by the flat press method. Only Rotocuring eliminates this major cause of belt failure.

Many of the premature failures of conventionally-made conveyor belts can be attributed to *overcured* or *double-cured* segments of 2" to 4" wide across the entire belt. These "Achilles Heels" occur every 30 to 40 feet and cannot be eliminated in conventional or flat press curing because the earlier cured sections in this "stop and go" operation move forward *less than a full press length* each time.

Realizing that continuous vulcanization was the solution (and the *only* solution) to this problem, BWH technologists developed ROTOCURE. In this BWH *continuous* curing process, press overlapping is impossible, overcuring is completely eliminated and flex life steps up as much as 40%.

What's more, users of BWH ROTOCURED belts have found that ROTOCURE eliminates mechanical distortion at the press ends... assures constant, uniform stretch... provides uniform, abrasion-resistant covers.

It all pays off in longer belt life, less maintenance and appreciable cost per ton savings in material conveyed. Ask your BWH distributor or write us direct.

You'll find these advantages in BWH rotocured transmission belts, plus a higher coefficient of friction since no dusting agents are needed. Because of this, you can operate at lower tensions — an additional factor contributing to longer belt life.

### DIAGRAMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS



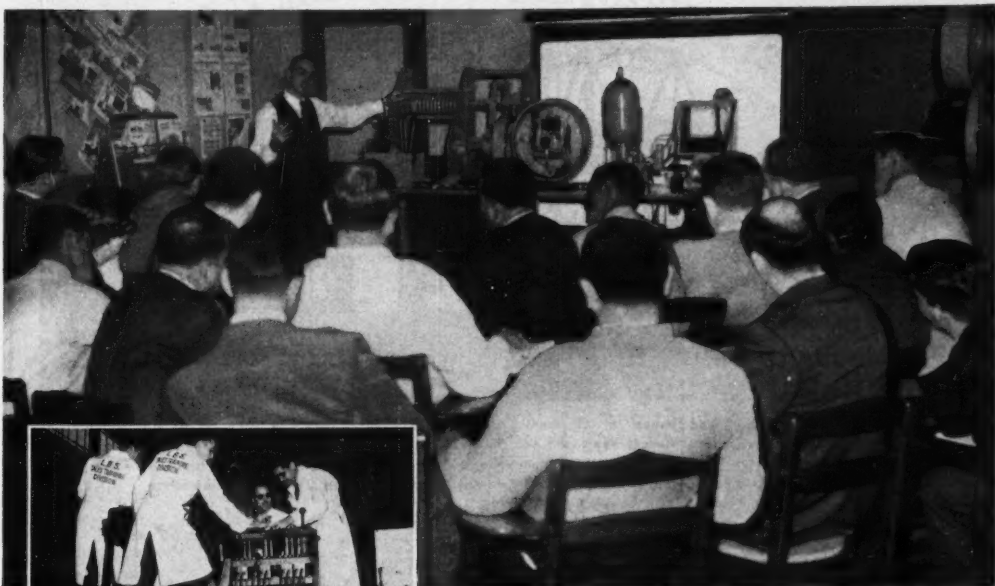
Another Quality Product of

## **BOSTON WOVEN HOSE & RUBBER COMPANY**

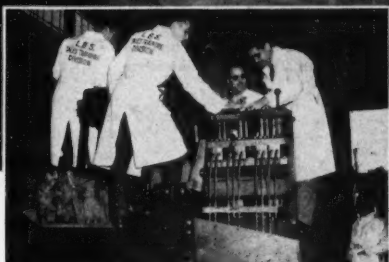
Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

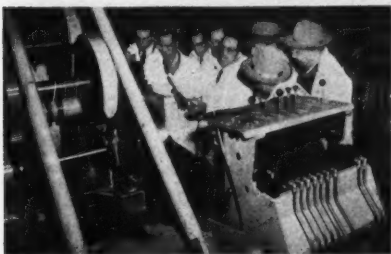
## **YOUR DISTRIBUTOR is in this picture!**



Typical classroom scene at the Link-Belt Speeder Training School, Cedar Rapids, Iowa.



Distributors' servicemen get close, first-hand knowledge of every part of a Shovel-Crane and its attachments.



Factory operations are studied throughout—from blue-print to final assembly.



Distributors' servicemen operate and service Shovel-Cranes in field demonstrations of typical applications.

### **Men who sell and service LINK-BELT SPEEDERS are schooled to serve you better**

#### **LINK-BELT SPEEDER**

Every year large classes of Shovel-Crane specialists are graduated from the Link-Belt Speeder Training School. These men have studied every phase of Shovel-Crane application, operation, construction and maintenance. Distributors and their sales and servicemen attend the school periodically. Many return again and again for "refresher" courses.

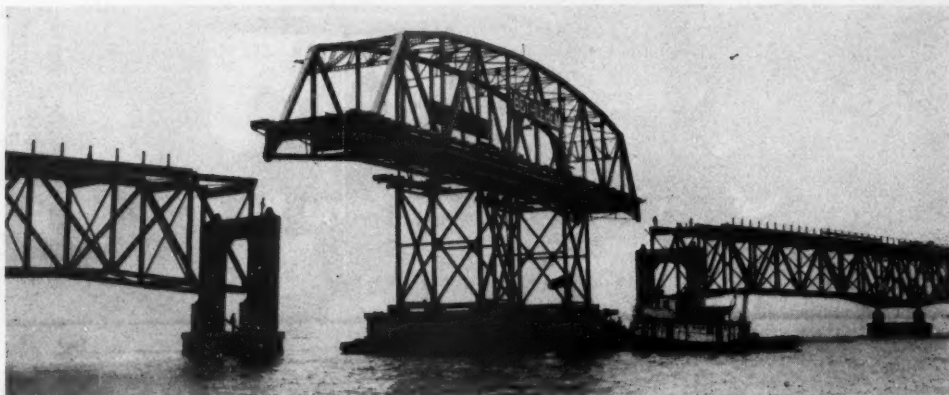
The Link-Belt Speeder Training School is only one feature of the Link-Belt Speeder Service Program. In addition, each district is supported by a factory service supervisor who is thoroughly familiar not only with the product, but also local conditions, and conducts regional service schools with distributors' and customers' service personnel. Parts stocks and modern repair facilities are available through distributors and factory . . . both attempting whole-heartedly to supply parts as quickly as possible in these difficult times. Just another reason why with a Link-Belt Speeder you'll handle more work, more kinds of work, more of the time.

### **LINK-BELT SPEEDER CORPORATION**

Builders of the most complete line of shovels, cranes and draglines  
**CEDAR RAPIDS, IOWA**

12,540

## Construction News in Pictures . . .

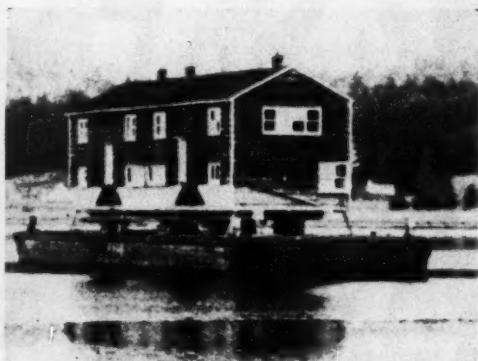


**BRIDGE BARGING**—Last and largest of 11 spans floated into place in Boston's Long Island Viaduct nears end of 2½-mi barge trip from assembly site. This 250-ft through truss span weighing 266 tons will be swung into position directly over its steel

shoes on the piers at high tide, then ebbing tide will gradually lower it and land it in place, 50 ft above water. Bethlehem Steel Co. is erecting 3,550 tons of steel for the two-lane 3,450-ft viaduct; Merritt-Chapman & Scott Corp. built substructure



**HOUSE HAULING**—Four-family 20x80-ft house, 32 ft high and weighing 60 tons, is hauled 40 mi by truck and barge from Poulsbo (Wash.) to Tacoma. Contractor for moving 40 of



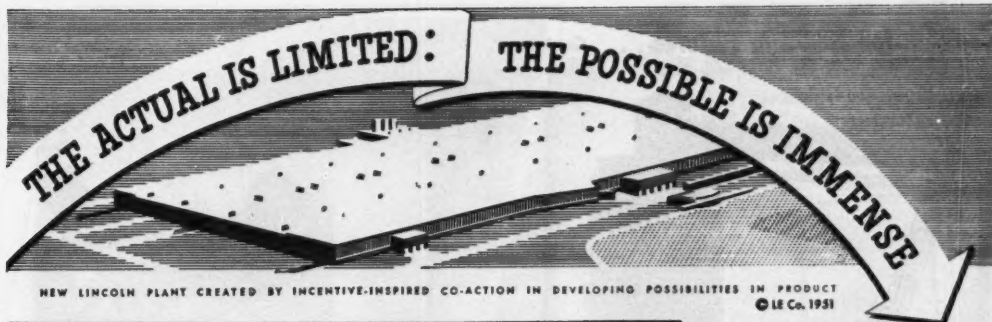
these buildings at cost of \$120,000 is Seattle's Northwest Hauling Co. During move, house rests on specially fabricated 14x18-in. laminated timber beams 80 ft long, supported by three dollies.



**RESERVOIR ROOFING**—Forest of shoring supports forms for concrete roof over 50,000,000-gal, 475x575-ft reservoir in Pasadena, Calif. Supported by 644 concrete columns, roof slab

will be topped with 2-ft earth layer to serve as park and playground. General contract for \$1,050,000 for reservoir and pumping station is held by E. C. Nickel, Pasadena.—Wide World photo



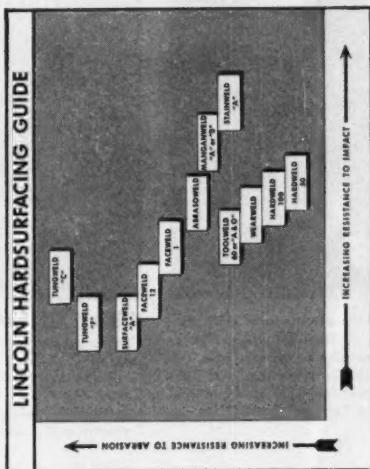


NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT © LE Co. 1951

## HARDSURFACING GUIDE FOR LONGER WEAR ... AT 30% LESS COST

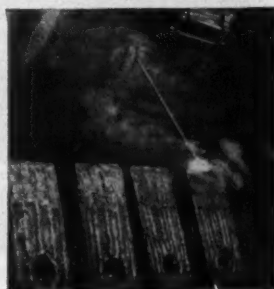
**L**INCOLN'S complete line of hardsurfacing electrodes are *priced at an average of 30% less* than other electrodes . . . yet out-perform any rods now on the market!

The chart shows Lincoln's 12 different types of electrodes, each designed for a specific range of service to resist abrasion and impact. These electrodes not only cut hardsurfacing costs but give superior wear resistance on all types of earth-moving and construction equipment.



Lincoln Hardsurfacing Guide quickly shows what type of electrode to use to best resist impact and abrasion. Ask for Bul. 466.

### NEW LIFE FOR OLD TEETH



Hardsurfacing for Severe Abrasion. Dipper teeth are tipped with Lincoln "Tungweld" (tungsten carbide type) electrode. Lower heads on teeth are "Abraweld" for severe impact and moderate abrasion.

### ONE SPROCKET DOES WORK OF FOUR



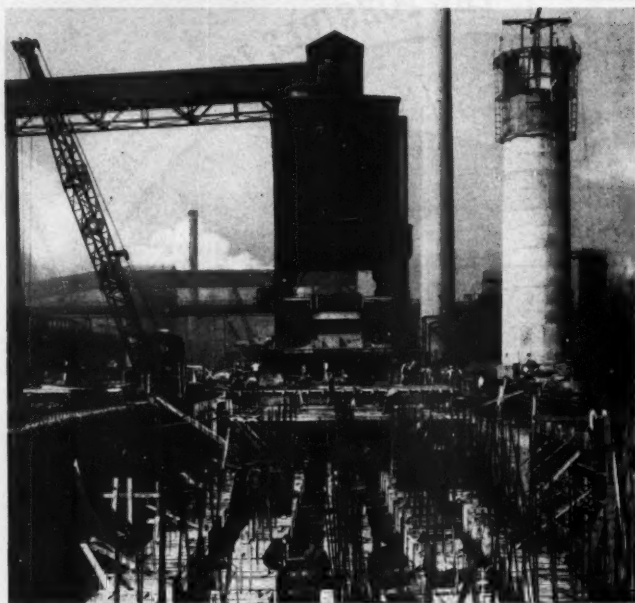
4 Times the Life is obtained by hardsurfacing worn teeth of power shovel sprockets with "Hardweld 100," reports Al Johnson Construction Co. on Pennsylvania flood control project.

SEE HOW TO SAVE 30% ON  
HARDSURFACING ELECTRODES

Bulletin 466, Lincoln Weldirectory for Hardsurfacing, available.  
Write on your letterhead to Dept. 174.

**THE LINCOLN ELECTRIC COMPANY**  
CLEVELAND 1, OHIO

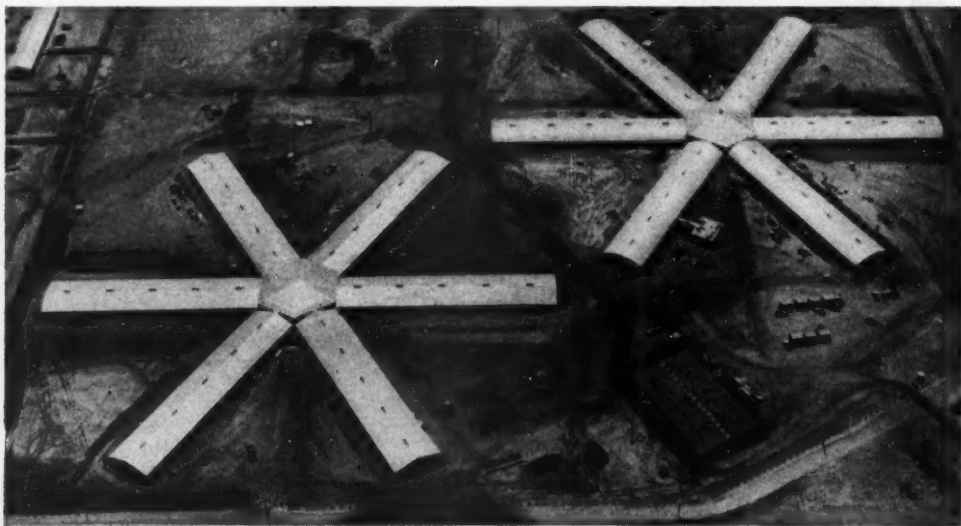
## Construction News in Pictures . . . Continued



**OUTSIZE OVENS**—Foundations are built for new coke oven battery of 77 units at Gary (Ind.) Works of Carnegie-Illinois Steel Corp., a U. S. Steel subsidiary. To be completed this year, ovens will produce 380,000 tons of coke annually, an increase of 40,000 tons over output of old battery they are replacing. Contractor is Wilputte Coke Oven Division of Allied Chemical & Dye Corp. The 11-month job calls for 4,500 cu yd of concrete, 700,000 lb of reinforcing steel, and 11,350 tons of brick in more than 700 various shapes and sizes.—U. S. Steel photo



**X-RAY EXAM**—Welded joint in pipeline taking Texas natural gas to New England is X-rayed by portable machine riding top of 24-in. line. Tulsa's Oklahoma Contracting Co. is putting in this section near Westfield, Mass., for Northeastern Gas Transmission Co.—Wide World photo



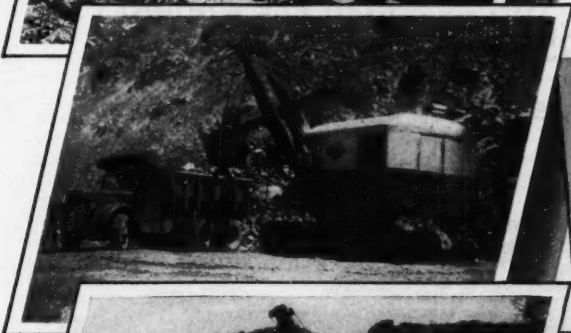
**ATOMIC ATTRACTION**—Spoke-shaped steel buildings at new Savannah River hydrogen bomb project near Ellenton, S. C., house offices of Atomic Energy Commission and E. I. du Pont de Nemours. DuPont is general contractor for \$600,000,000 plant

where components of the hydrogen bomb will be made, and will operate it for AEC upon completion, which is scheduled for late 1953. Scattered over 200,000-acre project site, close to 6,000 men are now at work; peak will be 35,000 next year.—Wide World photo

# LIMA

CAPACITIES

CRANES-Up to 110 TONS  
SHOVELS- $\frac{3}{4}$  Yds. to 6 Yds.  
DRAGLINES-Variable



## LIMA Rubber Mounted TRUCK CRANES in 20 and 35 Tons Capacity

LIMA rubber-mounted cranes offer you the added benefits of greater mobility, less travel time and better maneuverability. Rotating assemblies have the same basic features as corresponding crawler machines, with alterations adapting them to truck or wheel mounting. With outriggers supported, they provide extra capacity; are ideal for operations requiring constant movement around the job, for small scattered jobs, or remotely located.

## FIRST BY COMPARISON

LIMA Shovels, Cranes and Draglines have always stood alone by comparison because they are engineered and built to give every user the best value for his investment. Their high productivity, versatility and money-saving features keep down-time

to a minimum and output at a maximum.

Investigate LIMA shovels, cranes and draglines. See for yourself how they help you get greater production at lower cost. Baldwin-Lima-Hamilton Corporation, Lima-Hamilton Division, Lima, Ohio, U. S. A.



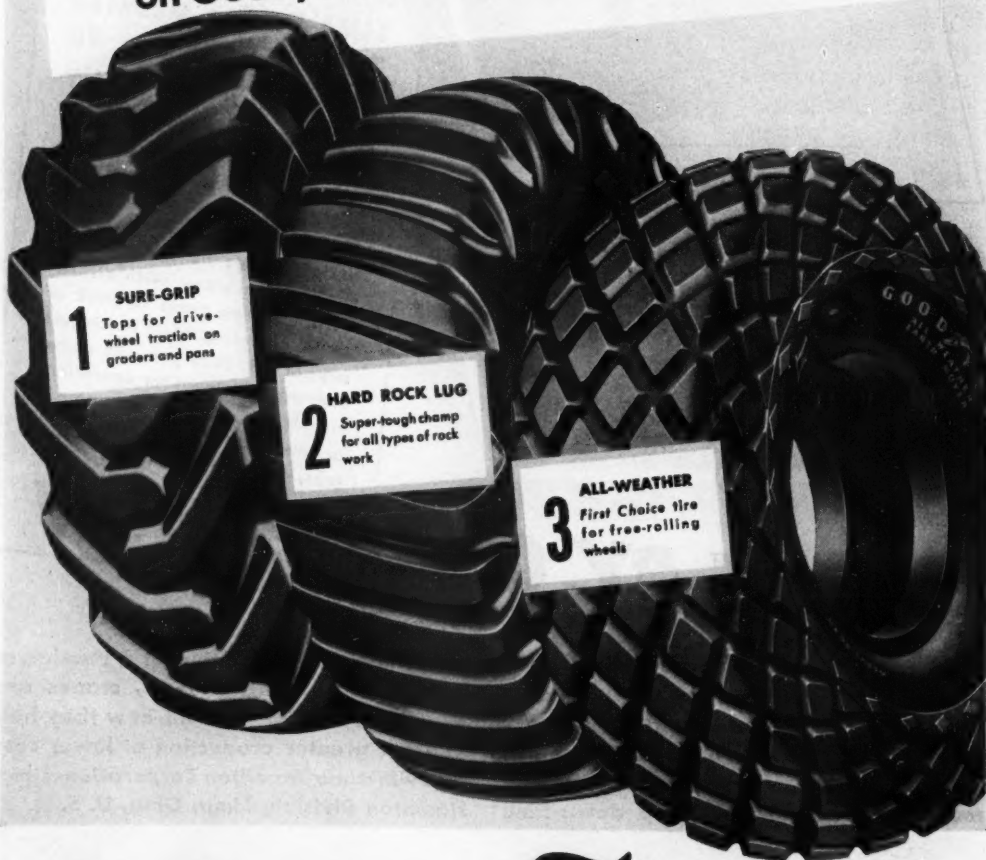
T2101

SALES AGENTS IN PRINCIPAL CITIES OF THE WORLD

## BALDWIN-LIMA-HAMILTON

# 3 BIG REASONS WHY

♦ ♦ ♦ Again in 1951, more tons are hauled  
on Goodyear tires than on any other kind!



1

#### SURE-GRIP

Tops for drive-wheel traction on graders and pans

2

#### HARD ROCK LUG

Super-tough champ for all types of rock work

3

#### ALL-WEATHER

First Choice tire for free-rolling wheels

# GOOD YEAR

Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio



Harold W. Richardson, Editor

## It Takes All Three . . . but All Three Can Do It

CONSTRUCTION'S STRENGTH for the job of building for defense depends a lot upon how well we keep up the equipment now on hand. Contract awards for heavy and industrial construction in this country are running 77% ahead of last year's record volume. But the full impact of the big volume of awards made last spring has not yet been felt in the field. Therefore, the peak demand for construction equipment is yet to come.

Despite the large amount of work done last year we didn't suffer too much from lack of equipment. Though manufacturers were hard pressed to keep up with orders, and many fell way behind in deliveries, we got by all right because of a vast inventory of equipment in the field.

Construction rolls into the big production season of the current year under a changed equipment situation. Because of material and component shortages, manufacturers are even more pressed to meet the production demand. Then, too, a big share of their output is going to the military, to our overseas operations, and to our allies. Not very much new equipment is available for the big domestic job of construction.

The situation is not too bad at present because of the large amount of equipment still in the hands of contractors. And it won't get to the alarm stage if we keep our present supply in top operating condition. That means paying more and more attention to equipment maintenance.

Responsibility for keeping our equipment in shape is three-fold—divided among the manufacturers, the distributors and the contractors.

The manufacturers' responsibility lies in producing the necessary repair parts, to see that these parts are distributed where vitally needed, and to supply the technical help, literature and information to keep the equipment rolling. They will need the sympathetic help of control and military authorities in Washington on parts production. These administrators must realize the importance of keeping our construction plant in good repair, for construction today is an indispensable part of the military and defense program. A review of parts required to be furnished with each machine bought for military purposes, for example, might ease the critical parts situation.

Distributors, as usual, can be counted

upon for invaluable help in the equipment maintenance job. They have the shops, the trained personnel, and the know-how to shoulder a big share of the burden. They, too, can help by disseminating technical advice, and operating and maintenance manuals to their customers. Distributors, we are sure, will step up their repair operations to meet any and all demands occasioned by the emergency situation.

Contractors, of course, have the final responsibility in keeping their equipment in good shape. They must become more maintenance minded than ever, must devote more care to inspection and to preventive maintenance, and more attention to instructing operators on correct handling of machinery to conserve its life.

This entire issue is devoted to equipment maintenance. It is full of ideas, hints and experience records that will help every equipment user to keep his machines in good shape.

We can keep our construction plant in good repair to meet all present and future requirements. But it takes all three—manufacturers, distributors and contractors—to do it, and all three working together *can* do it.



**SPIKE SEZ**—There's three of a kind Uncle Sam can draw to for a winning hand that will stand up against any national emergency. The three of 'em together can lick anything that comes down the construction pike.



By keeping miners at the face supplied with well-serviced tools . . .

## Good Maintenance Paces 25-Mile Tunnel Job

YOU'VE GOT TO GIVE your tunnel equipment mighty good maintenance to keep six headings going, round the clock, on a 25-mi job. And the Walsh-Perini combine has a servicing set-up that does just that on their East Delaware Tunnel through the Catskill Mountains for New York City's Board of Water Supply. There, some of the maintenance is handled within the tunnel, some on the surface at portals and shafts, and some in a central shop. But regardless of where the actual maintenance is done, it keeps the six headings steadily advancing because of the ready availability of well-serviced equipment, sharp bits and good drill steel.

The tunnel is part of the Delaware Aqueduct, and runs 25 mi from Pepacton Reservoir behind Downsville Dam (see article on page 86) to Rondout Reservoir at Merriman Dam. Finished diameter

is 11 ft, 4 in. The bore is being attacked from two portals and two shafts (605 and 965 ft deep), with headings worked both ways from each shaft. Ground is horizontally bedded shale and sandstone. Drilling is with rail-mounted jumbos carrying six Gardner - Denver drifter drills on G-D hydraulically operated booms. Bits are all four-point carbide-insert type, either Rockbit or Timken, on 1¼-in. hollow-round drill steel. From a 2-in. starter, the bits decrease ½ in. with each steel change, which is 3 ft. The 43 to 50 holes in the pattern are drilled 9 ft to pull eight, and daily advance per heading approaches 50 ft. Spoil is loaded by a Conway 100-hp mucker into 6-yd mine cars that are hauled by General Electric or Goodman locomotives to portal or shaft for dumping.

Equipment maintenance is exemplified by the procedure fol-

lowed at Shaft 1. Here, three muckers (one for each heading plus one as a standby) and all mine cars are serviced down in the tunnel. Once each shift, muckers are greased and oiled, and checked by a mechanic to catch any trouble before it becomes serious. For quick replacements in case of breakage, spare parts such as belt, chains, frictions, brake bands and dipper teeth are kept close at hand at the base of the shaft. Mine cars are given a thorough greasing once a week. Locomotives are hoisted to the surface daily for battery charging, and they are serviced at that time. The shaft hoist, too, is given a once-a-day check by an oiler who services all fittings and cleans the mechanism, and by a mechanic who inspects bearings, force-feed oil pumps, and other vital parts.

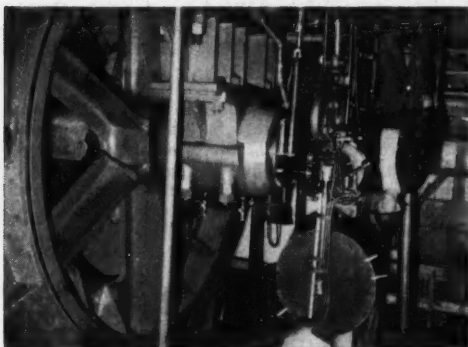
Drills and bits are serviced in



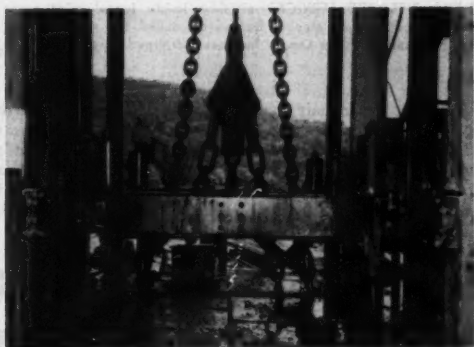
**MUCKER IS GREASED** while parked on passing track between rounds. The 100-hp Conway is big stuff for this size tunnel.



**LOCOMOTIVES ARE SERVICED** in shop above ground, where wheels are greased, motors oiled, brakes checked and batteries charged. Here, in foreground, finished battery is ready to be lifted from charging rack by spreader bar slung from 6-ton LoHed monorail hoist.



**HOIST AT TOP** of 606-ft shaft access to two headings is checked and serviced daily. Huge Lambert unit carries 700 ft of 1½-in. cable and is powered by 500-hp General Electric motor.



**SKIP IS INSPECTED** regularly for safety, but job-made drip-pots oil guide rails automatically. Pots are simply short, closed lengths of 4-in. pipe with petcocks and copper oil-drip tubes.



**DRILL DOCTOR HANDLES REPAIRS** to tools from both headings worked in two directions from common shaft. Repair areas are at benches set along tunnel wall in each heading. At left, drill doctor



checks drifter after replacing water tube that caused trouble. At right, he fastens Dixon fitting to heavy Goodrich air hose with Punchlok bander that clamps it tight in seconds.

the tunnel at a wall-side bench in each heading. A single three-man crew (drill doctor, bit grinder and helper), working one shift only, moves between the two headings

to handle the work, as required. Three spare drifters are kept at each face, ready to go to be slapped on to the booms fast when others break down. When this occurs,

usually because inexperienced miners let the drifters work loose, thereby causing excessive parts wear, drill and shell are removed as a unit and sent back to the drill



**DRILL BITS ARE SERVICED** at shop inside tunnel after every third round. At left, steel is backed off dulled bit, which is held by bit wrench whose handle has been dropped through hole in

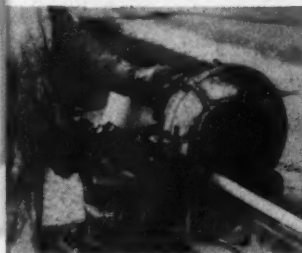
bench. In center, carbide-insert bit is sharpened on Norton Crystolon wheel in Thor air-driven grinder. At right, freshly ground bit is checked for gauge to determine right steel length.

doctor at the repair bench. There it is mounted on a stand made from an old column-and-bar assembly, where it is given a complete overhaul and worn parts are replaced. Because dampness in the tunnel

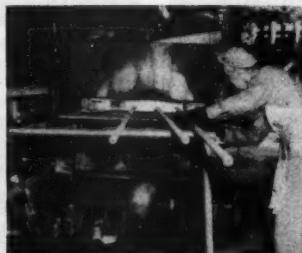
causes rapid rusting, spare parts are kept in a stockroom above ground at the shaft. Spares are mostly such small things as bushings, chucks and water tubes because Gardner-Denver has set up

a warehouse near the Walsh-Perini central project office in Roscoe, N. Y., where major parts and assemblies are available. Thus, the contractor's parts supply problem is considerably simplified and his

## How to service drill steel efficiently, as shown



**1 CUT STEEL** to correct length. Here, Ingersoll-Rand machine's 12 1/2-in. wheel trims end of 1 1/4-in. hollow round stock.



**2 HEAT SHANK END** to 1,800 deg (yellow-white) to prepare for forging. Pipe racks hold rods in Gardner-Denver furnace.



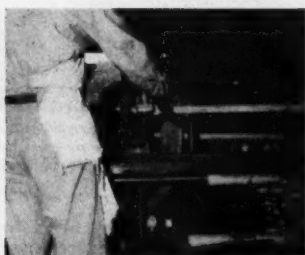
**3 FORGE SHANK** on heated steel. That's Nick Stimec, shop foreman, at controls of his Gardner-Denver shank sharpener.



**7 SLOW COOL** thread end in box of mica overnight for good annealing. This insulating material also slows up oxidation.

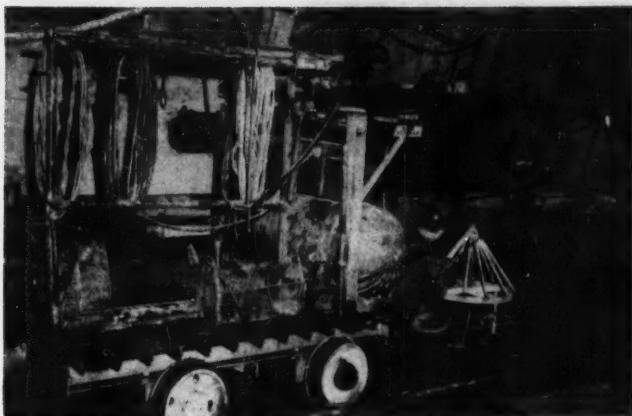


**8 CUT THREADS** after end has cooled, here done with Toledo machine. Drain the cutting oil from hollow rod for re-use.



**9 GRIND OFF END** of shank square for efficient operation in drill. This I-R air-driven grinder squares it up neatly.





**WELDING INSIDE TUNNEL** is handled by mine car carrying Lincoln electric arc-welding machine and tanks of oxygen and acetylene, as well as hand tools. At rear, guard cage is being built to protect face end of tunnel vent pipe from damage due to blasting.

inventory is kept to a minimum.

Each heading is served by two drill-steel cars, one working at the face and the other parked at the tunnel shop where bits are sharpened. The cars carry a full set of

steel, and are exchanged after a maximum of three rounds so the miners are kept supplied with sharp bits. Bit grinding is usually just a simple matter of touching up the crown and dressing the sides

on a wheel, which takes about 1 min per bit. Average net bit life is 1,000 lin ft of hole. This includes bits that are lost completely, and ones that have lost some of their carbides. Bits with one or two carbides missing are still used, but in the latter instance the two remaining inserts must be opposite each other to maintain hole gage.

All drill steel is processed in a central shop at the contractor's Roscoe headquarters where it is cut, shanked, threaded and tempered. An accompanying series of step-by-step photographs shows these operations in detail.

Contractors for the \$44,000,000 tunnel job are Walsh Construction Co., Davenport, Iowa, and B. Perini & Sons, Inc., Framingham, Mass. Jack Macdonald, Walsh's vice-president, is in charge of the combine. Charles F. Kelley is project manager, A. J. Allio is project engineer, Clyde Turner is general superintendent, and Jack Fanning is master mechanic. For the New York City Board of Water Supply, N. L. Hammond is department engineer and W. C. Thomas is division engineer.

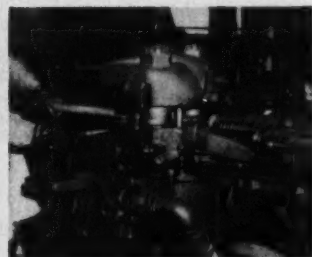
## step-by-step at East Delaware Tunnel field shop



**4 REPUNCH HOLE** in shank to  $\frac{3}{8}$  in., then put rod back in shanking die for a few finishing blows. Let steel cool off in air.



**5 HEAT THREAD END** in another furnace, this one held at 1,900 deg, so steel reaches the right temperature for swaging.



**6 FORGE UPSET** for shoulder and stock for threads, which will be cut later. Repunch blow hole same as for shank end.



**10 HEAT AND QUENCH** both shank and thread ends. In I-R tempering furnace with pyrometer control, shank is

soaked for 45 min at 1,550 deg and thread is soaked 25 to 30 min at 1,450 deg. Quenching in water (rear) completes operation.



**11 STRAIGHTEN** any bent steel, and check blow hole. If muck plugs it, ream with hand drill and wire auger.

## Amis Believes in Central Shop Maintenance

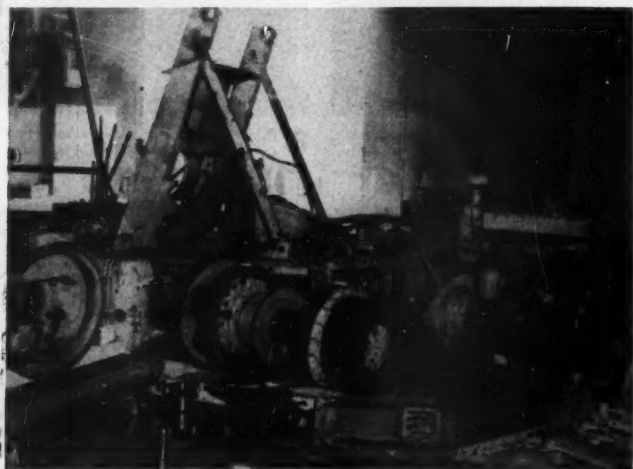


TOP BRASS of Amis Construction Co., caught in conference in their air-conditioned offices. Here are the two brother-partners heading up firm: Rufus T. Amis, Jr. (left), vice-president, and W. D. Amis, managing partner.



BEHIND THIS NEAT COTTAGE that serves as Amis Construction Co.'s main office is the big shop building, set in a 16½-acre lot,

where they can completely overhaul any and all equipment. Rose covered fence frames this attractive layout.



OVERHAUL at Amis means complete teardown to last integral unit. Here is a Koshing shovel dismantled for rebuilding.

AFTER FIFTY YEARS in business, Amis Construction Co. of Oklahoma City are thoroughly sold on a central shop layout for most efficient maintenance of their big line of heavy equipment. Behind the rose-decked shrub-encased cottage that serves as the firm's main office in the outskirts of the city lies the main shop and parts building flanked by two storage sheds. Including spacious yard areas, the home plant covers 16½ acres.

The Amis company engage in all kinds of heavy construction, including dams, bridges, railroads, highway grading, bituminous and concrete paving, levees and industrial plants. Except for participation in joint ventures where they wander far afield, they stick pretty close to Oklahoma and surrounding states. Highway contracts in their home state run about \$3,000,000 per year, an indication of the size of Amis operations. At present the



EVERY PART of a dismantled machine is thoroughly cleaned by steam before the units are sent to various parts of the shop for repair and overhaul.



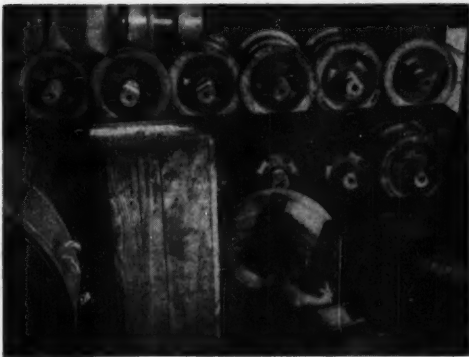
WORN PARTS, such as this crusher roller, are built up by welding with Stooday rod.



SOME EQUIPMENT is entirely rebuilt in central shop, like this sheepfoot roller. Note feet, rebuilt and hard-surfaced, are welded to bands clamped around roller.



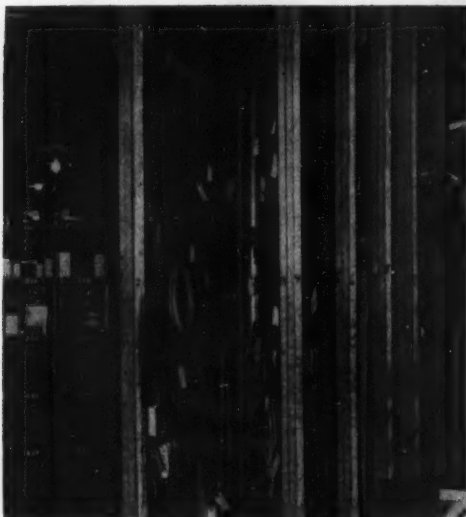
TRACK ASSEMBLIES, both new and rebuilt, are kept ready for quick transfer to job for ready replacement, cutting down time equipment is out of service.



MANY SUB-ASSEMBLIES, like these track rollers, belting transmissions, motors and radiators, are made up at Oklahoma City shop ready for quick transfer to field. If necessary, these units are flown to job.



EVERYTHING IS SHIPSHAPE in parts department, where thousands of items are neatly stored in numbered bins, kept track of by a card index system. Here is Richie Williams, parts department manager, amid some of his numerous storage bins.



GASKETS are kept on hinged screens (left) for easy access and quick identification. At right is a section of standard stock item storage area. These items are bought in quantity from mill supply



houses. By careful arrangement of bins according to parts types and machine makes, large stock is carried in relatively small space.



IT LOOKS LIKE NEW, and actually it is as good as new, but really this is a rebuilt Parsons ditcher just rolled out of shop, complete with new Jiffy buckets and knock-out teeth and repainted in manufacturer's original color.



APART from repair and overhaul of machines, the Amis equipment division is responsible for setting up new outfits. Here is a brand-new Pioneer all-electric asphalt plant, powered by two Caterpillar generators, set up in shop yards for a dry run just to make sure everything is mechanically O.K.

firm is engaged in a joint venture for Cedar Bluffs Dam in Kansas, about complete, and for Falcon Dam on the lower Rio Grande.

So far as possible, the company endeavors to bring all of its own equipment into the Oklahoma City shops for major overhaul. Lowboy and high-bed trailers do the transporting of off-the-road units. For running repairs and routine maintenance each job is assigned a trailer van carrying parts and tools.

Amis believes in preventive maintenance, too. On larger jobs, where there is a sufficient multiplicity of equipment units so one can be taken out of service without disrupting progress, machines are pulled off the line after 200 hr of operation for careful inspection. Such procedure, of course, is impracticable on small operations, and, in these days of tight equipment supply, even on larger jobs. Consequently, the regular inspection is giving way to another procedure—general maintenance supervision by a traveling master mechanic.

He makes every job once a week or every 10 days to confer with the mechanics, to inspect equipment at work and to check the local supply of parts.

Sub-assemblies are kept ready at Oklahoma City for quick transfer to any job when needed. These, and any required parts and even mechanic personnel, are flown to





EQUIPMENT for repair and overhaul is brought to the Oklahoma City shops by trailer, unloaded off a concrete ramp built to truck-bed height.



ALL SIGNS needed by company are made up in shop. Amis is one contractor not timid about advertising their jobs. The company believes ample signs and courtesy to the traveling public pays off in goodwill.



EQUIPMENT SUPERINTENDENT Harold S. Bullard is responsible for all Amis equipment and is also in charge of central shop.

the site in the company's plane in case of emergency.

The big central shop at headquarters is well equipped with overhead and rolling cranes, gas and electric welding outfits, steam cleaners, machine tools and a paint shop capable of handling complete overhaul of any of the 175 pieces of major equipment owned by the company. It is manned by 15 full-time mechanics and welders. Facilities are also available to repair and rebuild batteries, generators, starters, radiators, fuel pumps, magnetos and injectors. Tires are sent to commercial shops for repair.

Detour, warning and company signs are also built in the shop. Also, everything coming into the shop is repainted before it goes out. Rather than establish any particular color as the company's own trademark, Amis believes it better to repaint in the manufacturer's original color. This, they say, helps in the sale of equipment no longer needed.

A large stock of parts and supplies is maintained at the central shop. Small items are kept in bins generally grouped according to make of machine. Specific engine and equipment parts are obtained from distributors, but many standard stock items, such as hose, belting, filters and friction materials are purchased in quantity through mill supply houses.

The Amis system of records is most complete. On the wall in the office of George Stiers, general superintendent and chief engineer, is a big chart showing the location of every piece of equipment by colored pins. All other records are kept in the parts department.

Every piece of equipment is numbered, and this number, along with the machine's description, cost and date of purchase is entered on a master file. Also on this record is a complete history of the machine, showing length of time spent on each job, and detailed cost items of all parts and labor going into repair and overhaul. When cylinders are re-bored or size of bearings is changed, such information is also noted. Repairs made in the field and all equipment transfers are reported to headquarters on printed forms for entry on the master file. Copies of job records of oil, grease and fuel consumption are also sent in. Amis can instantly determine the fuel consumption per working hour of every piece of equipment they own.

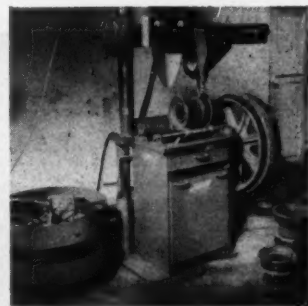
A perpetual inventory of all parts and supplies is kept on a card file. Costs are also entered on the cards for information in determining repair charges against a machine.

The accompanying pictures show some of the shop features and operations.

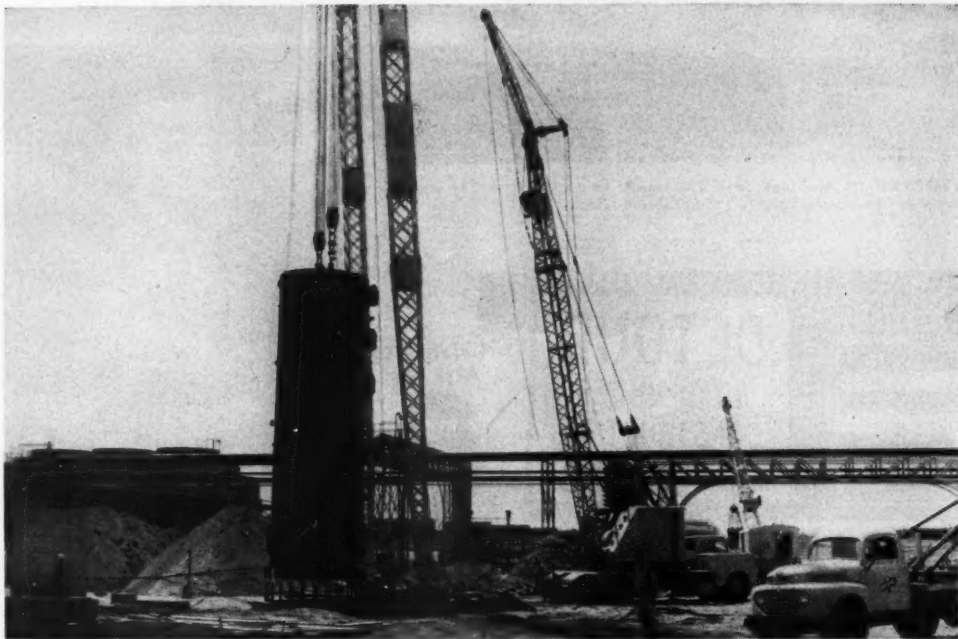
W. D. Amis is managing partner, and R. T. Amis, Jr., is the other

partner of the Amis Construction Co. The shop and all repair work are under the supervision of Harold S. Bullard, equipment superintendent. Richie Williams is manager of the parts department and is also in charge of the equipment and parts records.

### *Maintenance Tips...*



FOR FASTER and better building up of tractor track rolls and idlers, Peoria Tractor & Equipment Co., Caterpillar dealers in Peoria, Ill., have installed automatic welding machinery as shown here. The rig, made by The Leader Welding & Mfg. Co., Berkeley, Calif., features a submerged arc-welding head. This equipment enables the distributor to give 24-hr service in rebuilding a complete set of rollers and idlers for a D8 tractor.—From Caterpillar Tractor Co., Peoria, Ill.



BECHTEL CORP. EQUIPMENT is scattered from coast to coast on typical jobs like this oil refinery at Ponca City, Okla. Because of

their widespread operations, the firm depends solely upon distributors for repair service instead of setting up shops of their own.

## Bechtel Depends Upon Distributors For Service and Repairs



HEAD MAN of Bechtel's equipment department is Glenn E. Buchanan. A graduate engineer, Buck worked on construction for Bechtel until tapped to head the equipment department. He's more likely to be found out in the field than sitting at his desk.

NOT EVERY BIG CONTRACTOR establishes extensive field and central shop facilities for equipment maintenance and repair. The Bechtel Corp., with headquarters in San Francisco, is a notable example of departure from customary procedure. This firm, one of the country's largest with nation-wide and overseas operations, has no major shops. Not that they don't own lots of equipment—they are loaded with it—and of course, their vast array of machines needs regular, and frequently emergency, maintenance and overhaul. However, because of the widespread operations of the firm, they find it more economical to use distributor repair facilities in the area where the equipment is being worked.

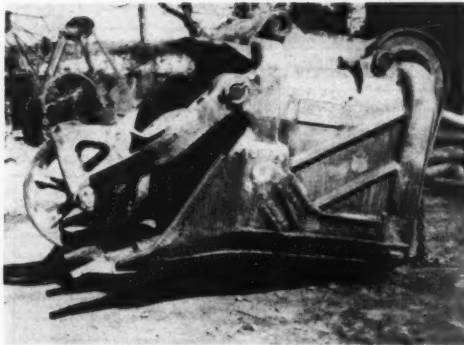
Bechtel has found that this fits in well with long-established policy of keeping equipment in the highest possible state of repair. They have found that means a lower cost job and these savings are reflected in cost to the client.

This all stems from a philosophy expounded years ago by W. A. (Dad) Bechtel, founder of the firm. He wanted to keep rigs good-looking, well painted and in clean operating condition. This, he believed, would help keep the confidence of the client and would give workers added pride in doing a good job.

(Continued on page 185)



# Hard-Facing<sup>1</sup> is Making a Name in



THIS 3 1/2-YD ESCO BUCKET from a 1201 Lima shovel has been hard-faced four times before, inside and out, by C. J. Langenfelter & Son Inc. of Baltimore. Because bucket is positionable, Stooddy



Self-Hardening 21 is applied to top, bottom and sides. When welding cannot be done downhand, Stooddy 1027 is used. Stringer beads behind solid deposit will prevent wash in highly abrasive work.

EACH YEAR MORE and more contractors are turning to hard-facing as part of their regular maintenance program, and each year they agree it's the most economical method of prolonging equipment life, reducing big parts inventories and limiting down-time on equipment due to replacement or repair.

Shovel lips and teeth, idlers, drive sprockets, scarifiers, blade edges, sheepfoot tampers—in fact almost every part that suffers impact and abrasion—can be safely and quickly built up and hard-faced by any capable welder to give it a new lease on life.

C. J. Langenfelter & Son Inc., Baltimore contractors, can vouch for the practicability of hard-facing, which has become as important a department of their maintenance set-up as lubrication and overhaul. The accompanying photos speak for themselves.

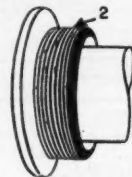
The success of arc-weld surfacing, they will tell you, is dependent upon proper choice of rod, and this is determined in turn by the work to be done, composition of the part, and size, shape, thickness and location of the area to be surfaced. Metal-to-metal friction, earth abrasion, heat and impact are synonymous with heavy construction equipment and obviously no one hard-facing alloy will provide all the life increase desired under all the various operating conditions.

Plain carbon steel, low carbon low alloy steel, austenitic and high manganese steels, copper and copper alloys can generally withstand sudden temperature changes and need no special precautions before

## CONSTRUCTION

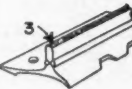
### TRACTOR TRACK ROLLERS

Set on jig for downhand welding. Apply circumferential beads, running on flange where necessary.



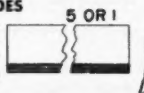
### TRACTOR GROUSERS

Weld steel bar stock to pads in wide, heavy passes at high heat to original height; then hard-face.



### BULLDOZER BLADES

Bolt blade to mold-board. Preheat, approx 400 deg F. Apply stringer beads to make deposit 1 1/2 in. wide.



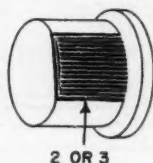
### BULLDOZER END PLATES

On worn plates, first build up new corner; apply beads diagonally at outer corner and then along edges.



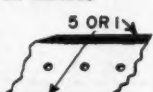
### BULLDOZER TRUNNIONS

Remove bearings; then apply H-F to work area, peening each bead as deposited to aid in shaping.



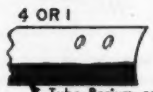
### CARRYING SCRAPER BLADES

Bolt blade to mold-board. Apply hard-facing with weaving motion, but not exceeding 1 1/2 in. width.



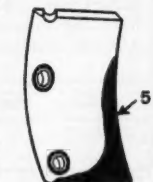
### GRADER BLADES

Bolt 2 blades back-to-back; preheat to 400 deg. Apply stringer beads, extending up edges 2 in.



### GRADER END BITS

Lay end bit flat; then apply 1 lb per bit diagonally across outer corner and all along edges.



## Definition of Rod Numbers Shown in Sketches

**1 STOODY SELF-HARDENING 21** — Rod fabricated as a tube, containing alloying elements. Produces extremely high abrasion resistance and is designed for parts of heavy equipment where wear is excessive. Deposits are not forgeable.

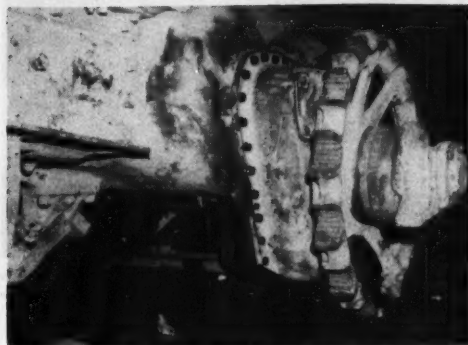
**2 STOODY SELF-HARDENING** — Fabricated electrode, alloys consisting of chromium, manganese, silicon and carbon. All position welding. Forgeable at red heat. This rod is designed for high resistance to earth abrasion and impact.

**3 STOODY 1027** — Coated rod with steel core and extruded coating. Good for all-position work, producing high impact strength, especially for parts that cannot be positioned for downhand welding—buckets, pump casings, impellers. Deposits forgeable at red heat.

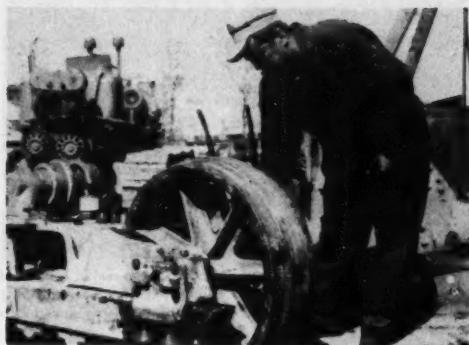
**4 AND 5 TUBE BORUM** — Mild steel tube filled with crushed and screened carbide (Borum) particles, hardest known commercial metal. For this reason, excellent for earth abrasion, cutting, granite, coal, shale, etc. Three types: electric, acetylene and AC-DC.



# Contractors' Maintenance Programs



**DRIVE SPROCKETS AND IDLERS** for tractors, shovels and other crawlers should be mounted on a jig for downhand welding after building up low spots to within 3/16 in. of finish size. Using



templet for proper shape, sprockets should be coated with transverse beads of S-M 21 or 1027, then peened into shape while red hot. Apply hard-facing on idlers in circumferential beads.

## ROAD RIPPER

Cover about 2 in. on top and sides of teeth; then apply 2 lb above it on leading edge.



## SCARIFIER TEETH

Starting at point, extend deposit 2 in. upward. Use excess acetylene flame if using torch.



## ROAD DISKS

Hard-face in flat position. Put first of 1/4 in. beads 5/16 in. from outer edge. Fill to 2 1/2 in.



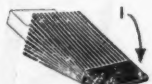
## DITCHER TEETH

Sharpen dull teeth. Cover cutting faces 3/4 in. up from point; also outer sides of outer teeth.



## DIPPER TEETH

Cover all sides 2 in. up from point. Stringer beads behind solid deposit will prevent wash.

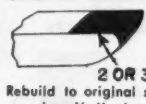


## DITCHER DRIVE SEGMENTS

Same procedure as on ditcher drive sprockets. One pound generally covers 10 to 12 teeth.

## SHOVEL LATCH BARS

Rebuild to original size, peening 1/2-lb deposit while at red heat to obtain proper shapes.

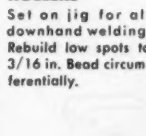


## SHOVEL LATCH PLATES

Apply hard-facing to worn area and peen deposit while at red heat to obtain smooth surface.

## SHOVEL ROLLERS

Set on jig for all downhand welding. Rebuild low spots to 3/16 in. Bead circumferentially.



**6 HI-CARBON** — High carbon electrode for building up steel parts before hard-facing. Applied electrically or by torch.

**7 STOODITE** — Cast alloy with high percentage of chromium. Deposits polish to mirror finish, thus excellent for minimizing friction on metal-to-metal parts which must be smooth.

**8 MANGANESE** — Tubes filled with nickel and ferro-manganese used to build up worn manganese equipment prior to hard-facing. Bare rod deposits recommended for maximum

strength and wear resistance. Good for strength welds and other operations requiring a nickel-manganese electrode.

**9 BOROD** — Like Tube Borium, except smaller tungsten carbide particles which allow thinner deposits, especially on small parts or thin sections subject to extreme earth abrasion.

**10 STOODY 6 AND STOODY 1** — Cast non-ferrous alloys, resisting impact and abrasion respectively. Resist corrosion and heat, as on temperature valves, dies, exhaust valves, etc.

build-up or facing. This is not so, however, with the harder metals and alloys, such as cast iron, ferritic and semi-steels, carbon or tool steel, etc. In this latter group, the harder metals are apt to crack, due to the thermal shock when striking an arc. Preheating to 300 or 500 deg F is the answer here, along with slow cooling and post heating if necessary.

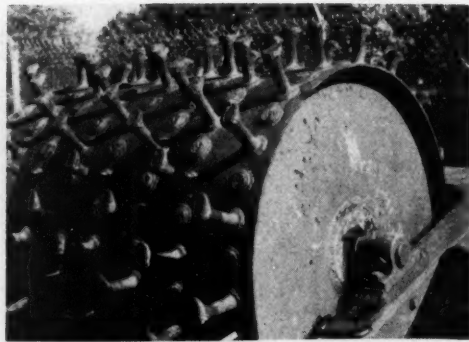
Some rods are primarily designed to combat simple abrasion, some to withstand impact; others resist corrosion while some are able to retain their chief characteristics even at extreme heat. Often it may be necessary to select a rod that meets a combination of two or more of these factors. One of the companies that manufactures several different types of hard-facing alloys is Stooddy Company of Whittier, Calif.

Langenfelder has standardized on Stooddy rod for all hard-facing operations. We asked about their welding procedure for various equipment parts and items. In answer, the contractor handed us their bible, the Stooddy Hard-Facing Guide-book, so we are reproducing Stooddy recommendations for various applications.

The quick reference chart shows their suggested procedures for more than 50 pieces of equipment. Self-Hardening 21 is best for severe impact, regular Self-Hardening for a somewhat equal combination of abrasion and impact, and Stooddy 1027 for very high impact strength and fairly good resistance to abrasion wear. (Continued on next page)



ONE OF MANY SHEEPSFOOT ROLLERS rejuvenated over and over again by Langenfelder Co., before (left) and after (right) hard-facing. Here a single heavy pass of self-hardening rod is



sufficient on corners and edges, using about 1/4 lb per tamper. Note where old tampers were burned off after several facings, then new ones placed in checkerboard fashion. Both sides of these ...

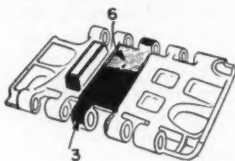
## CONSTRUCTION—cont'd AGGREGATES



### SHOVEL DRIVING TUMBLERS

Set tumbler on jig for downhand welding. Rebuild to 3/16 in. and hard-face, using template as guide.

### SHOVEL TRACK PADS



Rebuild worn areas to within 3/16 in. of original size and hard-face as shown in drawing.

### POST-HOLE AUGER TEETH

Using excess acetylene flame in oxyacetylene torch, hard-face top surfaces and outer edges.



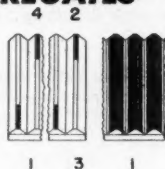
### POST-HOLE AUGER FLIGHT



Apply approximately 2 lb for a 12-in. auger, on upper surface and edge of flight.

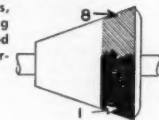
### CRUSHER JAWS

Tackweld jaws back to back, then equalize heat by hard-facing intermittently as illustrated.



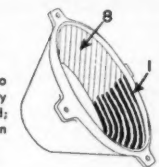
### GYRATORY CRUSHER MANTLES

Rebuild worn mantles, then hard-face, using skip-welding method to avoid any overheating.

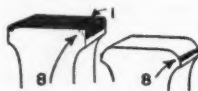


### GYRATORY CRUSHER LINERS

Place liner on floor so that all welding may be done downhand; apply 75 to 100 lb on 3-ft liner.



### CRUSHER HAMMERS



Rebuild to size where necessary. Weld sides and tops of 4 hammers alternately to avoid overheating.

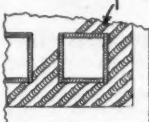
### CRUSHER ROLLS

Rebuild worn rolls with carbon or manganese rods; then cover with skip-weld transverse beads.



### SIZING SCREENS

Clamp screen to plate, preventing distortion. Deposit around blocks and on screen surfaces.

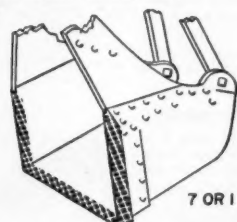


### ROCKER ARMS

Hard-face areas subjected to wear as indicated in sketch, then grind whenever necessary.



### CLAMSHELL BUCKET LIPS



Use No. 7 if positionable; No. 1 otherwise. Skip weld manganese lips. Steel lips may warp.

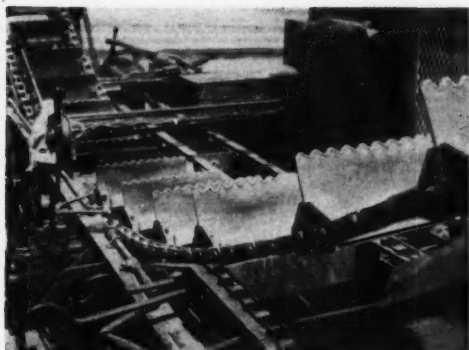
Tube Borium is used on earth-cutting parts, Borod for earth abrasion on small parts or thin sections, and Stoodite for metal-to-metal friction. In addition Stoody 6 and Stoody 1 are suggested for resisting heat and corrosion in combination with abrasion.

Before some equipment can be hard-faced it may often be necessary to rebuild it to its original size and shape. For this build-up operation, a high carbon rod should naturally be used on carbon steel base metals and a manganese rod on manganese steels.

Other companies make similar

rods for every need, but label them quite naturally, with their own trade names.

One of the latest developments in this field is production of hard-facing alloys in coil form for application with an automatic electric head. This may be used wherever a large number of similar parts are



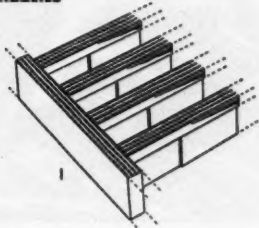
... SUBGRADER FINS are coated with Tube Borium, which has particularly high resistance to wear from sliding friction; thus is used extensively on augers, disks and scarifier teeth. Out in yard ...



... WELDER BUILDS UP eyes and pins on Caterpillar D-8 blade and arms. Note cover plate of steel, welded to arm over small crack, as added reinforcement.

## MISCELLANEOUS

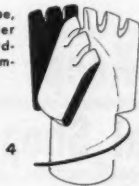
### GRIZZLIES



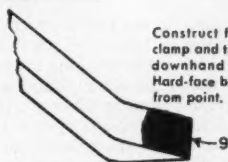
Hard-face laterals and runner tops according to wear patterns. Skip weld to minimize warping.

### BLAST HOLE DRILLING BITS (Overburden)

Build to size, shape, gage, with copper back-up form; hard-face cutting and reaming edges thus.



### AUGER BITS



Construct fixture to clamp and tilt bits for downhand welding. Hard-face back 1/2-in. from point.

### DUMP-TRUCK BODIES

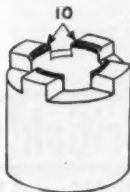
1/2" Stringers  
2" Apart



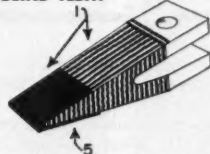
Apply stringer beads to angle iron as shown. Repeat before original deposit is worn off.

### ROCK DRILLS CHUCK JAWS

Preheat to 600. Hard-face and retard cooling by submerging in slacked lime or ground asbestos.



### DRAGLINE TEETH



Hard-face 2 in. on front with No. 1; same on back with No. 5, then stringer beads as shown.

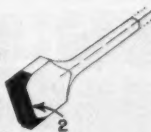
### DRAGLINE BUCKETS



Hard-face lips, top and bottom. Depending on wear pattern, put stringer beads on other sections.

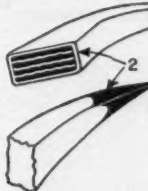
### TAMPING BARS

Apply 1 lb for 10 picks. Build up worn ends 1/4 in. thick; hold heat at cherry red and forge.



### PICKS

Apply 1 lb for 10 bars. Hard-face outside edges; hold heat at cherry red and forge to shape.



to be hard-faced or where considerable material is to be applied to a single large part. Work which lends itself to hard-facing by the automatic method includes gyratory, cone and roll crushers, tractor or shovel rollers and idlers, sheaves

mine car wheels, locomotive tires and scraper blades.

Most important—get to that part before it's completely worn, Langenfelter's maintenance men say. Analyze the need for impact or abrasion resistance, or any combi-

nation desired, and when in doubt, use a material which is tougher than that anticipated.

Equipment superintendent for C. J. Langenfelter is William Koppelman, who is responsible for all maintenance, including welding.



CENTRAL REPAIR SHOPS AND DEPOT for British contractor, John Laing and Son, Ltd., cover 18 acres at Elstree. Equipment comes into receiving bay (A), and goes through steam cleaning at (B). Heavy plant is sent to heavy shops (C), adjacent to welding shop (D) and machine shop (E). Special equipment is also made in these shops. Light equipment goes to light shop (F); automotive to trans-

port shop (H) and body shop (I). Non-mechanical items are rehabilitated in shop (J). All engines are overhauled in engine shop (G), which also contains fuel pump, injector and magneto shops. All outgoing units pass through paint shop (K) and to standing yard (L) awaiting shipment. Stores, parts and assemblies are housed in warehouse (M). General offices (N), and (O) is canteen.

## How Big British Contractor Keeps Equipment Rolling With Central Shops

A FINE EXAMPLE of construction equipment maintenance and repair comes from across the seas. John Laing and Son, Ltd., London, one of the leading contractors in the British empire, has a beautiful shop set-up at Elstree covering 18 acres amid landscaped gardens. Laing has a lot of American heavy equipment — loaders, wagons, scrapers, pavers, shovels, cranes and tractors—along with standard British equipment and many special units of their own make. As far as possible, everything is brought into the Elstree shops for

overhaul and major repair work.

As is the case in America, British contractors are coping with a tremendous construction program in the face of a labor shortage. Like us, they are meeting the challenge by increased production through mechanization. Laing, greatly expanding their operations since the war, has long realized that efficient construction operations depend upon equipment kept in top-notch condition. Equipment responsibility lies in the firm's Plant and Transport Department. Its function is to marshal all the plant and equip-

ment needed, to see that it reaches the contracts in time, and once on the job, to keep it in working order.

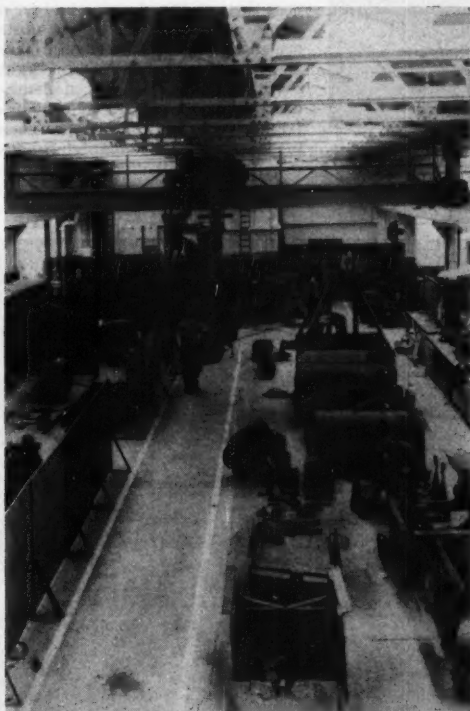
With the expanding activities and increased plant to take care of, the Department decided it wise to change its maintenance procedure from all-field work to a centralized operation, resulting in establishing the Elstree Plant and Transportation Depot, completed last year. They believe a muddy, windy job site is no place to overhaul complicated machinery. Large, properly-equipped shops, with expert mechanics on hand





**BIG EQUIPMENT** is completely dismantled for overhaul in the heavy shop area. Engines are pulled and sent intact to engine shop.

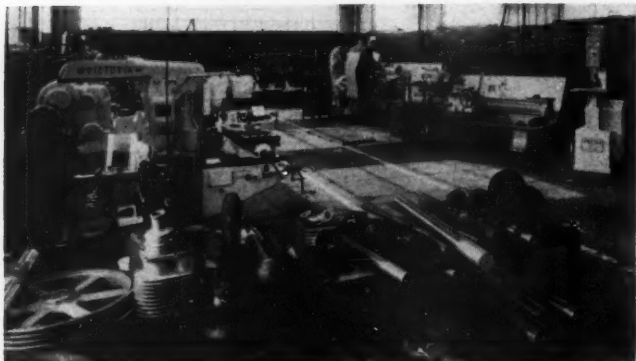
Adjacent welding and machine shops build up and rehabilitate parts worth salvaging.



**WORN EQUIPMENT** worth salvaging, and hard-to-get parts and units are built up for further service in this reclaiming bay, part of the machine shop.



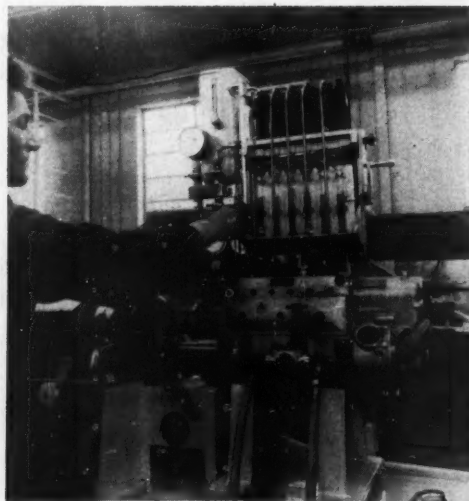
**HUGE STORES DEPOT** houses 45,000 different parts running into hundreds of thousands of items. Card index system keeps track of everything on hand here and in job depots.



**WELL-EQUIPPED MACHINE SHOP** not only helps rehabilitate equipment brought in for overhaul, but also turns out special unit designed by the contractor's mechanical engineers.



**LIGHT EQUIPMENT** is overhauled and rebuilt in this expansive shop devoted exclusively to that class of machinery. Engines are pulled and sent to engine shop.



**FUEL PUMPS AND INJECTORS**, after overhaul, are scientifically tested by instruments before being replaced in engines.



**TIRES**, large and small, are stored in temperature-controlled warehouse. American contractors, please take note.

and with proper tools available, are much better for efficient, fast overhaul.

However, the Department still utilizes site repair gangs for emergency or minor operations. In cases where it is impracticable to bring a big machine into the central shops, major overhaul is done at the site by mobile repair units. Rather than completely dismantle machines in the field, the mobile units install replacement engines and complete sub-assemblies drawn from the Elstree depot.

All repair operations are supervised from headquarters. Inspectors from Elstree regularly visit all jobs, collect equipment information, check on the care and operation of all equipment, and decide when the machines should go to the shops for overhaul. Ultimately the Department hopes to bring in every machine for overhaul after so many hours of operation, regardless of condition, but this goal as yet has not been achieved.

The general layout of the Elstree central shops is shown in the accompanying aerial photograph. From the receiving bay everything goes through the cleaning bay for a steam clean-up. Thence the units are distributed, according to classification, to the heavy shop, light shop (automotive), or non-mechanical shops. Whatever its distribution within the shops, each machine or unit is completely dismantled, and all engines and mo-

tors are sent to the engine shop for complete overhaul.

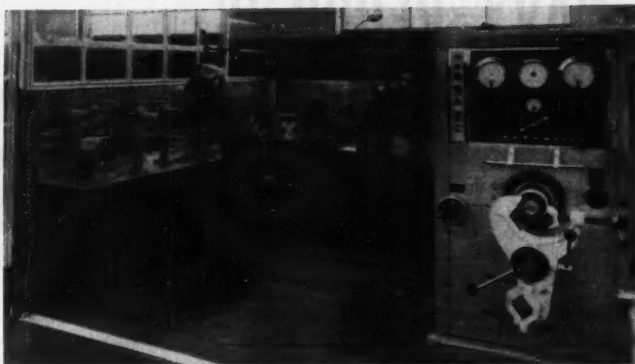
As the engine is dismantled, each part is labeled with a metal tag and is then put through a series of washing tanks activated by compressed air, and then thoroughly rinsed. Heavy parts are handled direct by overhead cranes; small parts are placed in wire baskets for dunking. After overhaul, every engine is given a working test, during which its performance is checked by instruments.

Special attention has been paid to cleanliness in the electrical, fuel pump, injector and general machine repair shops. Here the walls have been painted contrasting red and green according to color scientist recommendations for stimulating production. Fuel pumps, injectors and magnetos are repaired on aluminum benches for extra cleanliness.

Alongside the heavy equipment shop are the welding and machine shops. Here scarce parts and those worth reclaiming are built up, worked over and salvaged. Also, in these areas special equipment, designed by Laing's mechanical engineers, is built to order.

Automotive equipment is torn down to the last nut and bolt in the transport shop. Near by is a separate body plant for rehabilitating bodies and fenders. The non-mechanical plant takes care of bins, hoppers, buckets, road forms, etc.

Once overhauled, every item



ALL ELECTRICAL EQUIPMENT is rehabilitated and tested in this neat shop equipped with aluminum benches for cleanliness.

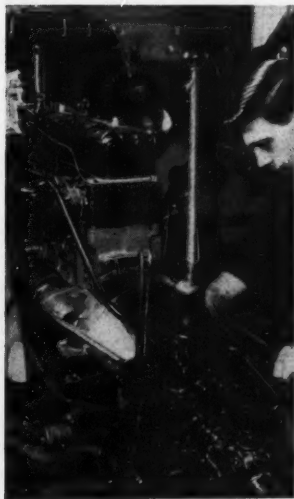
passes through the paint shop on the way out for a complete paint job. The last step is fastening an enameled sign on the machine carrying the firm's name. Laing is proud of their equipment, and they don't hesitate to advertise to whom it belongs. From the paint shop the equipment goes to hardstands awaiting shipment out to the job again.

A most important part of the central shops is the stores depot, where 45,000 different items are carried in stock. Individual pieces run into the hundreds of thousands. A temperature-controlled warehouse stores tires. Store items are kept track of by a card index sys-

tem that reveals everything on hand in the central shops and at every job warehouse as well.

Speed is the watchword of the stores depot—speed in turning out parts and supplies needed for central shops overhaul, and speed in delivering parts and assemblies as needed in the field. The company does not hesitate to fly a plane to the United States for parts obtainable only in this country, nor do they stop at distributing parts to jobs by plane when necessary.

H. E. Hodgson is manager of the Plant and Transport Department. K. C. Jerrard of the firm's London office kindly supplied the information and pictures for this article.



ANYTHING THAT MOVES on wheels can be handled in splendid transport (automotive) shop. Bodies go to separate shop.



READY TO ROLL. These trucks, rebuilt and painted like new, get their enameled company signs attached as last step.

# NAVY REBUILDS WARTIME EQUIPMENT

By L. L. WISE, Associate Editor

WARTIME SEABEE CONSTRUCTION EQUIPMENT is being put in "as good as new" condition by the Navy for the use of present and future Seabees. Repairable equipment has been brought back from Pacific Islands and, after repair, the rigs are placed in stock along with new equipment.

In the almost two years of operation of the repair program more than 2,200 pieces of equipment of all types have been rehabilitated at the Port Hueneme (Calif.) Advance Base Depot by Navy civil service employees. Cost of the work has been nearly \$1,460,000. This compares with the cost of buying similar items in the open market of about \$10,200,000. Additional machines are being repaired under contract by the Shepherd Tractor & Equipment Co., Caterpillar dealers for the Los Angeles area. Specifically, Shepherd is repairing 228 pieces of heavy equipment for about \$1,500,000. Approximate total cost of similar items new would be \$4,000,000.

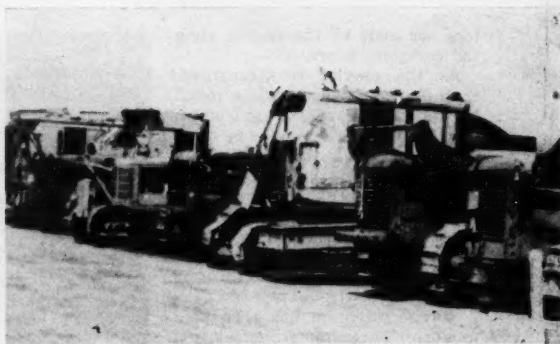
The purpose of the repair program is to provide equipment for the Navy's use that is every bit as good as new equipment. The program was delayed by (1) the desire to get servicemen home quickly after V-J day and (2) low postwar Navy budgets. It finally got under way early in 1949 when a survey team was sent to Pacific Islands for a brief inventory of equipment that might be available for such repair work. Based on these field reports, the program was activated and equipment started pouring in to Port Hueneme from many overseas bases.

After the equipment is unloaded, it is decontaminated by cleaning with steam to which a caustic is added. This is necessary to make sure that no tropical seeds or insects are brought back to this country.

Then it is stockpiled and carefully classified to see just how much repair is necessary. In general, if the estimated cost of putting it in "as good as new" condition is more than 30% of the cost of a new item, the unit is sold rather than repaired. Navy officials expect some items to overrun the estimated repair cost and that is why they use the conservatively low 30% figure.

Although overseas commanders were instructed to return only equipment that could be put into "like-new" condition, much equipment was returned that on close inspection was found to be not economically repairable. Sale of these units has netted \$5,000,000 which is being applied against the cost of new equipment.

The repair procedures followed by the Navy at Port Hueneme and by the Shepherd firm in Los Angeles are detailed in the following two articles.



BROUGHT BACK from Pacific Islands, this lineup of construction equipment will be rebuilt good as new by Navy. By spending

## 1. How the Navy Itself

FIRST STEP in the Navy's equipment repair procedure at Port Hueneme is to tear the units down to their basic essentials. Then parts are sandblasted, steam cleaned and put again in first class condition.

A complete stock of spare parts is available. For unusual items of equipment, such as a portable asphalt plant, spare parts are purchased, as needed. Some cannibalizing of major parts is practiced. For instance, should the crankcase housing of a tractor be cracked, a new one might be stripped from some other unit. In general, however, new parts are used.

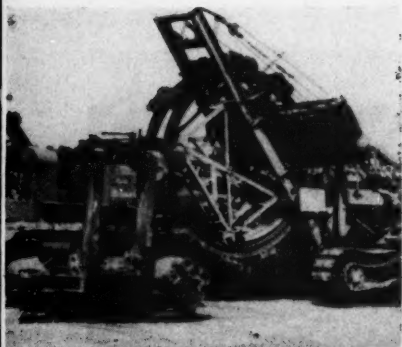
Work is usually done on several similar units at one time. That is, several tractors of identical make will be overhauled simultaneously. This promotes efficiency of operation.

Motors for all units are completely overhauled, even though the hour-meter shows little or no use. That's

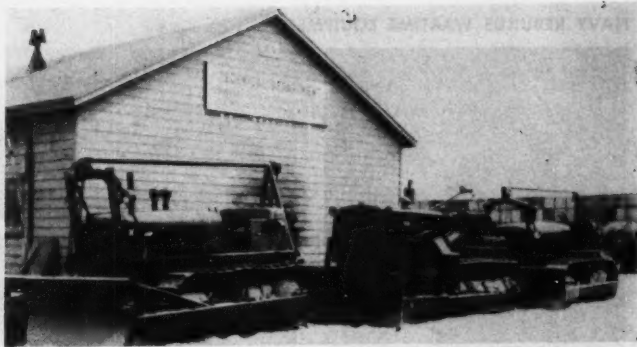


STEAM CLEANING is one of first steps in equipment rehabilitation program. Harsh caustic mixed with steam also kills plant and animal life sometimes brought back from tropical islands.





\$3,000,000 on program, \$14,000,000 of equipment has been made available.



READY FOR USE after rebuilding, tractors will be stockpiled or shipped immediately to active Pacific theaters. Tractors are in greater demand than any other type of rig.

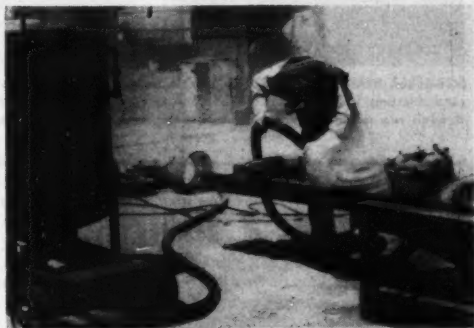
## Repairs Machines

because tropical moisture conditions could easily have done severe internal damage to the engines that could not be observed by an external inspection.

Some of the repaired equipment has been shipped overseas for immediate use as soon as it has been rehabilitated. Other units are stockpiled awaiting future needs. A complete stockpile is in any event maintained at Port Hueneme for future emergencies.

Rolling stock, such as tractors and rubber-tired scrapers, are exercised every 60 days to keep them in operating condition.

The work is under the direction of Captain Henry P. Needham, Officer in Charge, Advance Base Depot, Port Hueneme, Calif. E. S. Hobson as head of the ABD technical department is in direct charge of the civil service crews operating the rehabilitation program.



SAND BLASTING is another routine operation. Here, using portable blast machine, workman in "Man from Mars" outfit works over a series of brake drums spread out on racks in field.



TRACTOR IS STRIPPED down to crankshaft housing as its rebuilding gets under way. All parts will be thoroughly checked before reassembly of the equipment, and many new parts are required.

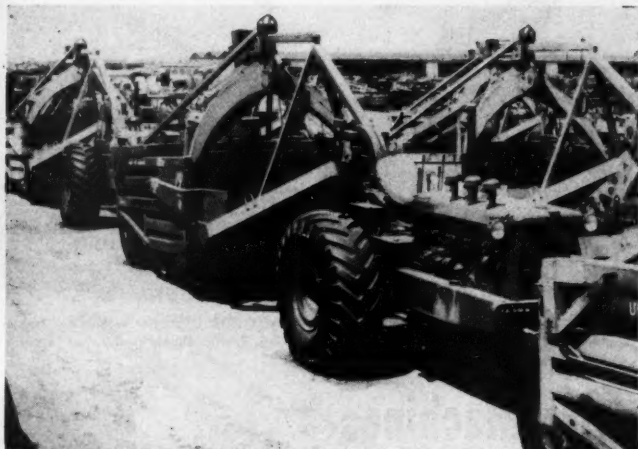


ENGINES ARE OVERHAULED even if hour meter shows they have never been used, because humid tropical climate may have done internal damage that would not otherwise be noted. All are tested.

For additional examples of equipment rebuilding, turn the page



**SCRUBBER** REMOVES CARBON monoxide from compressed air for sand blasting and spray painting. Navy-devised, it bubbles air through two water columns to remove compressor's exhaust fumes.



**PUZZLE**—Which machine has been rebuilt by Navy, which one is new? In this case, rebuilt rig is closest to camera, and it is expected to give just as good service as those factory-new.

## 2. How a Distributor Repairs Navy Machines

By JAMES JOSEPH, Los Angeles

OF THE 300,000 TONS of salvaged Navy construction machinery brought back in 50 shiploads to Port Hueneme, 228 pieces of heavy equipment (including cranes, tractors and graders) are being rebuilt as good as new by Shepherd Tractor & Equipment Co. in Los Angeles. This distributor has assigned 120 maintenance men to the project—one of the largest mass-rehabili-

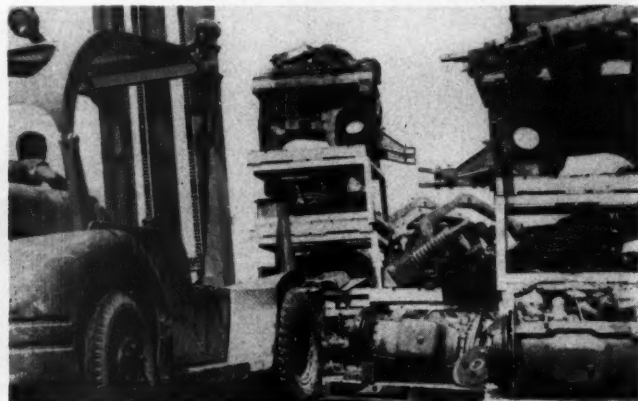
tations of heavy construction equipment to date, and the first entrusted to a civilian outfit.

Each machine shipped to Shepherd from Port Hueneme is immediately disassembled by a four-man crew, and all components of a machine are palletized. Pallets are 4x4-ft wooden panels that are handled by standard fork-lift trucks. Box-like steel frames 2½-ft high,

of 2½x2½-in. angles, fit over the pallets so they can be stacked on top of each other. Separate pallets hold such things as engine, transmission, final drive, or running gear. Each machine, as received, is assigned a shop order number. This number is tagged to the machine's pallets, which are grouped together in a storage lot. For less than pallet loads, each separate component



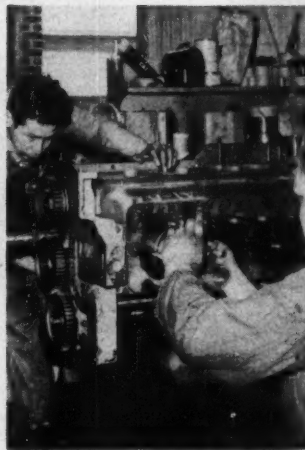
**AFTER DISASSEMBLY**, equipment is appraised by one of Shepherd's five inspectors to determine new parts needs.



**ON PALLETS** handled by fork-lift truck, disassembled machines are stored outside, row on row, awaiting their turn in repair shops. Los Angeles construction equipment distributor originated own type of pallets and box-like frames for stacked storage.



**PARTS** have delicate areas such as bearings masked over for protection before sand blasting. Note they're still on pallets.



**ENGINES** are completely overhauled in shop after mounting in jig that rotates unit at correct height for easiest servicing.



**COMPONENTS** also stay on pallets as much as possible. This rehabilitated unit is going from paint shop to its machine.

(rather than the pallet itself) is numbered and tagged. Usually, 50 machines are stored in the lot awaiting rehabilitation.

After equipment disassembly, inspectors appraise the components and decide which can be reworked and which need replacement or new parts to make the whole machine as good as new. Because the parts situation is critical — the usual waiting period being two to four weeks—immediate ordering is essential. And only coordinated advanced ordering and shop ingenuity keeps the rehabilitation program to its schedule of repairing 20 pieces of heavy equipment monthly.

Five trained men compile parts order lists from the inspectors' appraisals of needs. Nearly 100 suppliers are furnishing parts for the job. One order to a single supplier was 288 pages long, 17 lines to the page, and each line requested a quantity of parts. One manufacturer will receive more than \$90,000 worth of spare parts orders, according to the latest survey, before Shepherd completes its contract in about a year's time. Hardest items to get are bronze and roller bearings, high-alloy components and forged items. Parts that are presently unobtainable, or which incur a long wait, are either fabricated in Shepherd's shops, substituted, or the existing part repaired.

The single most interesting procurement and scheduling feature is that no parts whatsoever are held in stockroom storage. Once

received, parts flow directly to their assigned pallets, which calls for the closest coordination. Lloyd Somers, general service manager of Shepherd's shops, puts it this way: "We've got a rapid-flow system, where parts meet incoming and waiting pallets and progress from there through the sequence of re-manufacture."

Logical maintenance practice would be to re-work all equipment of the same make and model in sequence. But this won't work here, the distributor has found, because huge orders overload the parts manufacturers. Therefore, a few of each machine model are being repaired at a time—an out-of-sequence necessity to spread parts orders.

Twelve 20x40-ft shop-stalls have been assigned to Navy equipment rehabilitation. A two-man crew works on differentials. Four machinists re-work engines, which are held in Shepherd-invented jigs that allow 360-deg rotation while maintaining the motor block's average 40-in. height from the floor. A specialized cylinder-head shop installs false seats, reconditions such things as valves and precombustion chambers, and checks for cylinder head cracks with high pressure test equipment. The Navy does not favor cylinder head welding, so they're replaced. Another specialized precision shop receives pallet loads of delicate equipment. It cleans, tests, and reassembles fuel injection systems; carburetors and fuel pumps; and magnetos, generators and starters.

In six different crews, 30 men work in the assembly area. They divide roughly into: (1) Assemblers of major components; (2) truck assemblers; (3) transmission assembly; (4) engine overhaul; (5) wiring and electrical assembly; and (6) brake relining and adjustment of brake parts.

What have been the findings of shopmen concerning equipment so long at the mercy of the elements? Most of the machines now under repair were either new or only slightly used when abandoned during the rapid mustering-out of Seabee maintenance men, which left behind no skilled crews that might have mothballed the equipment. Most of the crankcases were not even drained. Thus, rust and corrosion, acid wear, and a general deterioration are the greatest causes of disrepair. About 15% of the gasoline engines require new blocks because of corrosion. Diesels need from two to four lines for a 6-cyl engine—likewise because of rust. Acids from crankcase oils have badly corroded almost all highly machined bearing surfaces. In diesels, about 50% of the main and connecting rod bearings need replacements. Valve springs and guides (on diesels) have been found in worst shape, as have been precombustion chambers. Surprisingly, only about half of the diesel injection equipment needs repair and at least half of the fuel pumps on diesel rigs need no parts replacement whatever. Maintenance men attribute this to their being tightly sealed against the weather.

# EARTHMOVING...An Art and a Science

## 7. Maintenance or Repair

BY DAN K. HEIPLE, Chief Field Engineer, R. G. LeTourneau, Inc., Peoria, Ill.

This is the seventh of a series of articles on the fundamental principles of earthmoving. Sections on earthmoving history, job analysis, equipment selection, ownership and operating costs, factors affecting production, production and cost estimates, and application of bulldozers, scrapers and rippers have already been published in our last six issues. Still to come are comprehensive articles on such subjects as tires, dirt compaction, and application of other types of equipment.—THE EDITOR

A LOT HAS BEEN WRITTEN on the subject of maintenance and repair. So much, in fact, that there is a tendency to consider the terms synonymous. Actually, go on to a contractor's job and find his shop loaded with equipment in for repairs, the master mechanic muttering "nuts and bolts" under his breath, and you have very likely found a job short on maintenance; the emphasis is on REPAIR. The two do not very often go together—therefore we say Maintenance or Repair. The difference is sometimes a very fine line in being ahead of the job or behind it.

Bear down hard on maintenance.

Maintenance is the little things; knowing them, doing something about them. When it comes to repairs, there is time to look in the book. A good preventive program can keep most repairs to the off shift or off season, but it doesn't gamble a 15-min adjustment against a couple day's repair job.

Every manufacturer publishes manuals covering the service and repair of his equipment. It would be impossible to cover the items for even one piece of machinery here. Following the recommended procedures outlined in these manuals is the first step. Beyond that, maintenance is nothing more than

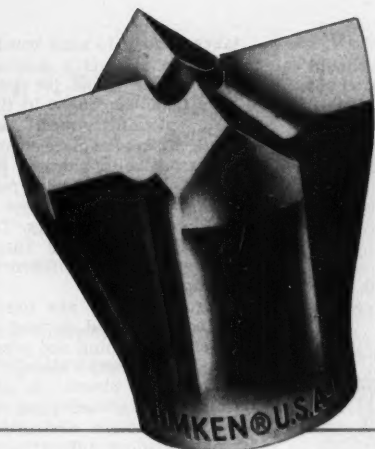


vigilance coupled with action; common sense. It is nothing more, for example, than standing under your own car on the grease rack while the attendant greases it, looking (you don't really know what for), and putting a wrench on all the exposed bolts you have time for. That doesn't mean that the manufacturer recommends tightening every bolt every day, even though there has been the somewhat just criticism that the manuals imply this. It does mean that if you ignore them all long enough, serious trouble can develop from small beginnings.

### 1. Fuel, Lubrication:

First on every list. The interval, grade, and quantity should be known, not guessed at. Over-lubrication at some points  
(Continued on page 70)





①  
MULTI-USE

②  
CARBIDE  
INSERT



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Which type of rock bit is the most efficient and economical for your particular job? You're sure of getting an impartial, authoritative recommendation from the Timken Company. We're the only manufacturer who makes *all three* types of rock bits:

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**TRUCK MOUNTED  
for Driveway or Highway**

**with these Distributor Features:**

- Load...Transfer...Spray...  
Handspray...Circulate...Suck-back  
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- Constant sprayline pressure maintained through by-pass valve to tank.



Truck Mounted Model RHU

This low cost machine is designed for jobs that would not be economical to handle with large distributors. For the smaller operator who wants to do more work—as well as for the larger operator for whom no job is too small. A complete road and street maintenance unit for cities, towns, counties and states with limited budgets.

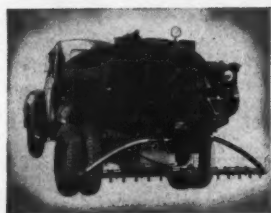
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Trailer Mounted Model RMT

**BITUMINOUS EQUIPMENT**

**ROSCO MANUFACTURING CO.**  
3118 Snelling Ave. • Minneapolis 6, Minn.

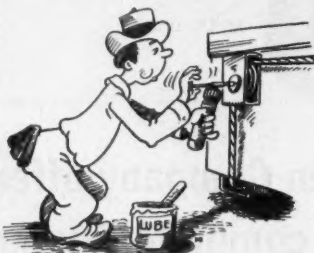


Rear view of Model RHU showing style "C" circulating spraybar

(Continued from page 68)

is also possible. Fittings should be wiped off first. Dirt can't get through grease fittings by itself, but it can block the passage of lubricant or be forced into bearings by high-pressure equipment. Dirty oil filters serve no purpose and can even hinder the flow of oil to bearings if badly clogged.

Clean around filler necks before adding oil or fuel. Wipe up any spillage afterwards.



Spillage camouflages leaks and collects dirt which may hide the beginning of other ills. Refuel at the end of shift rather than the beginning. A full tank collects less condensation than an empty one when equipment is standing. Proper lubrication also includes giving lubricants a chance to work in the start and warm up, as well as attention to pressure and temperature gages while running.

## 2. Fast-Wearing Supplies:

Trying to extract the last hour's wear from blades, cable, scraper ground-plates and similar items does not pay. A frayed, kinked or flattened



cable may take valuable production time to change, but it is easier to replace and takes less time in the shop than out on the haul road with a load on. Other hauling units may be forced to dodge the one stalled on the cut or fill, and it often

takes as long to send word to the shop and get a mechanic back as the whole job would have taken if caught in time. With planning, most cable changes can take place off shift.

Missing bolts, worn or broken blades and tips may result in damaged blade bases on bulldozers and scrapers. Turn the blades, or hard surface them, and replace broken tips promptly.

Ground-plates are quickly bolted or welded on, and can save straightening and repairing unnecessary damage to scraper side sheets. In addition, a worn ground-plate rides up over tough obstructions, makes loading difficult.

## 3. Tires:

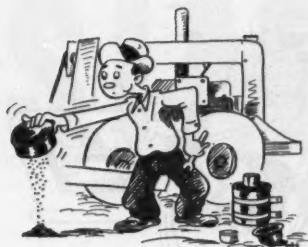
Inflation should be done when the tire is cold, and then left alone. Nails and other imbedded fragments should be removed. When flats do occur, an extra wheel with tire mounted is a time-saving investment. Bent rim flanges should be straightened or replaced at the first opportunity. Vulcanizing small sidewall cuts



to the fabric can now be done without removing wheel or tire and can save a sizable investment. Keeping haul roads swept clean of rock spillage will do a lot to increase tire life.

Keep valve caps on. Even if the tire and tube escape injury, a damaged, dirty valve can mean a tough and time-consuming replacement job.

Recap worn drive tires or shift them to trailing service. Do this before they are made worthless by cut plies or before they blow out on the haul with more lost time, jeopardizing life and expensive equipment.



#### 4. Air Cleaners and Pre-Cleaners:

Constant attention to these items is a *must*. In some classes of service, they need checking twice a shift. Clean air and clean fuel mean a clean engine and resultant long life between overhauls.

#### 5. Cooling System:

Clean water, tight connections, and correctly adjusted fan belts are axiomatic to keeping the engine at proper operating temperature. A leaky, dirty system can only get worse. It leads to more



work, more expensive troubles. Low coolant level results in alternate drying and flooding of the engine resulting in cracks. Broken temperature gages keep the operator in the dark, and may cause serious trouble before he realizes anything is wrong.

(Continued on page 72)

**NAYLOR Heavy-Duty WEDGE-LOCK Coupling**

The Fastest and Easiest Method of Pipe Connection...Developed for Use with NAYLOR Light-Weight Pipe

Given You These Advantages in Permanent or Temporary Service

- One piece construction—easy to install
- Saves time—quickest possible installation
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- Compact—saves space
- Permits use in tight work
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- Allows for expansion and contraction
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## MANPOWER BOOSTER

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Meet the increasing demand on available manpower with Coffing Safety-Pull Hoists. Here are mechanical muscles that are bought, not hired — and they're yours for keeps. With a Safety-Pull to relieve the burden of countless lifting, pulling jobs, more skilled effort is applied where it pays—in production.

Safety-Pulls work efficiently any place — indoors or out, vertically or horizontally. To assure long life, to protect your men and materials, each is factory tested at 100 percent overload. Start now to get the most from available manpower by enlisting the help of dependable Coffing Safety-Pull Ratchet Lever Hoists. Nine sizes with capacities from 1,500 to 30,000 lb. Write for Bulletin D7SP.

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Quik-Lift Electric Hoists • Hoist-Alls  
Mighty-Midget Pullers • Spur-Geared  
Hoists • Differential Chain Hoists • Load  
Binders • I-Beam Trolleys

## EARTHMOVING . . . Continued



### 6. Controls:

Bleed water from air tanks and lines daily to avoid corrosion or freezing. Keep hydraulic and air lines tight. Lost pressure lets clutches and brakes slip. You can nurse a poorly adjusted clutch for quite a while in a light car or truck,

but it won't last long in construction equipment. Sloppy adjustment on any operator control puts extra demands on operator skill, overstresses equipment, and results in less work. Poor brake adjustment can only be compensated for by slower hauling cycles or by extra hazards.



### 7. Structures:

Most breaks start small. Cracked welds, bent or broken beams and plates take less time and less money if spotted early. Weld them up before they

get in the major replacement or overhaul class. Occasional cleaning and painting serves the double purpose of subjecting the entire unit to inspection and protecting it against rust.

### 8. Timing—Records:

Don't burden maintenance personnel with paper work, but yet keep adequate records. The memory expert is still human and can forget or quit. Set up procedure for fast daily, weekly, monthly and seasonal maintenance. Operating hours are sometimes tough to keep track



of, so many manufacturers recognize this and set up their manuals on a calendar basis.

(Continued on page 75)



# SIMPLIFIED

## Austin Overshot Loader



### Check these outstanding features:

**Drive...**simple, positive; no cable or hydraulic drives; wears longer.

**Front Power Takeoff...**gives live bucket without master clutch being engaged; accurate control; easier to operate.

**Mounts on Main Frame of Tractor**

**Doesn't Interfere With Servicing of Tractor**

**Pre-Assembled...**entire drive unit is assembled and adjusted at factory—ready for you to put on.

**Doesn't Interfere With Drawbar**

**Automatic Control...**bucket stops automatically in dumping position.

**Brake Control...**hydraulic brake on rear spool shaft to control speed of bucket return.

**Uses No. 24 Cat P.C.U.**

**Good Visibility for Operator**

**Easily Converted to Dozer in 20 Minutes**

### SPECIFICATIONS

#### MODEL 6 C

Fits wide gauge, non-oscillating D6, without modification. Wide gauge, oscillating D6 can be modified to accommodate the 6C.

Standard Bucket Capacity in cubic yards (rated) ...1½

Bucket width .....6' Overall height .....18' 4" (bucket raised)

Overall width .....9' Overall length .....20' 8" (bucket lowered)

No. of bucket teeth.....6 Loading cycle (seconds) .....13

Dumping clearance...8' 1" Weight (approx. pounds) .....9,300

Overall height.....8' 2" (bucket lowered)

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2 SANTA FE DRIVE  
DENVER, COLORADO

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# 20 Million Yard Proof

## of Bucyrus-Erie Performance

Consistently high output regardless of weather or ground conditions makes Bucyrus-Erie walking draglines the choice for jobs like this twenty-million-yard channel improvement project in Louisiana.

One important reason is the exclusive Bucyrus-Erie walking mechanism for safe, smooth travel over

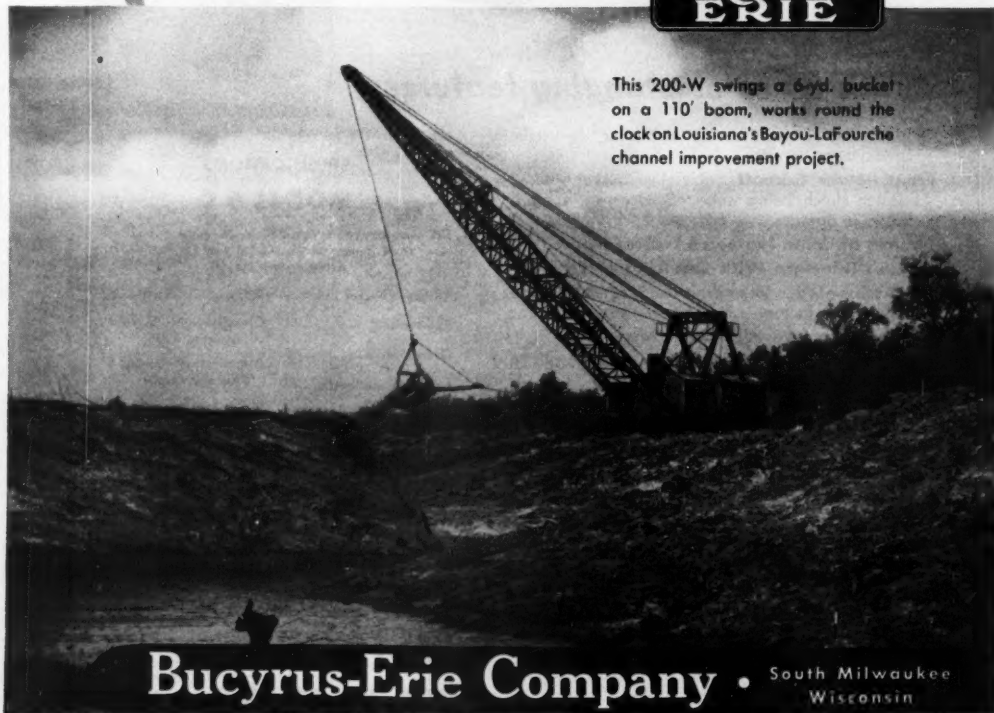
soft or uneven ground. Others are strong, simple design and construction, assuring reliable performance when working in remote locations, and quickly responding controls for fast, efficient operation.

These outstanding features, backed by Bucyrus-Erie's unmatched manufacturing and engineering experience, add up to top-notch dragline service. The years ahead machines in the complete Bucyrus-Erie line provide a size to fit any job.

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**BUCYRUS  
ERIE**

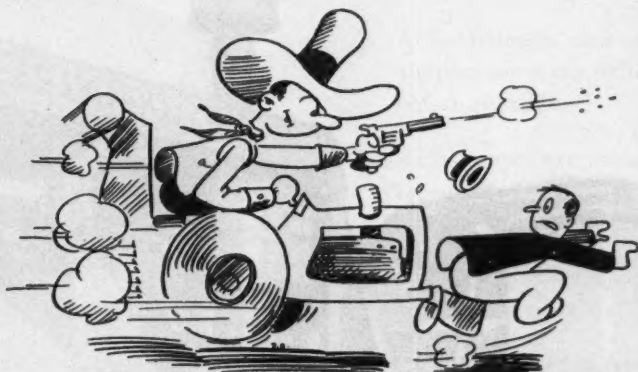
This 200-W swings a 6-yd. bucket on a 110' boom, works round the clock on Louisiana's Bayou-LaFourche channel improvement project.



**Bucyrus-Erie Company** • South Milwaukee  
Wisconsin

## 9. Nuts and Bolts:

Keep them tight. Wheels do come off; engines slide on the mounts, taking transmissions out; trailing units have been known to come unhitched, and fans to go through the radiator.



## 10. Operators

Rough, careless operation can nullify the best efforts of an expert master mechanic. Specify the method of operating, then get rid of the non-conformists and cowboys.

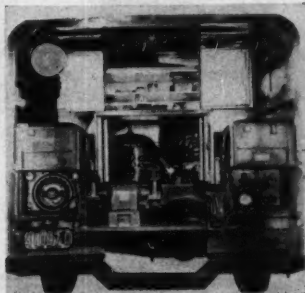
The list could go on; batteries, starting and lighting equipment, hydraulic pumps and cylinders. The good maintenance man knows these things better than they can be told in space allowed here. Remember: No check lists can replace a top-flight mechanic, but no real preventive program can exist without them.

## Maintenance Tips . . .



A SHOP TRUCK, based on the concept of job-site maintenance and embodying many new features proposed by the Army Engineer Research and Development Laboratories, has been produced commercially. A model has been procured by the Laboratories for rigorous military training.

The new highly mobile repair shop consists of a  $\frac{3}{4}$ -ton, 4x4 truck with a utilities type body, take-off driven welding and power generator, and oxyacetylene cutting and welding equipment.



Among the features proposed by the ERDL and incorporated in the present design are a low silhouette and locked, pilferage-proof, tool compartments for orderly tool arrangement. Oxyacetylene equipment is located on a step in the body to facilitate changing the gas cylinders and to lower the overall center of gravity of the shop.

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BY ITSELF!

THE LUFKIN  
"MICHIGAN"  
CHROME-CLAD  
BABBITT-TYPE  
CHAIN  
TAPE



You'll agree the Lufkin "Michigan" is in a class by itself for railroad, highway, and other hard service work. Its tough steel line is protected with several heavy coats of electroplating. Both the line and deeply stamped Babbitt metal bosses are chromium plated to give it a wear-resisting, corrosion-proof all metal outer jacket. Sturdy metal reel is dull black finished. Long extra-leverage folding winding handle. Complete with two leather thongs. Graduated in feet, links, or meters. Railroad Half-Gage Mark added when specified. Order a Lufkin "Michigan" from your supply house now.

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40.26 drawbar hp.  
11,250 lb.



70 drawbar hp.  
18,800 lb.



102 drawbar hp.  
27,850 lb.

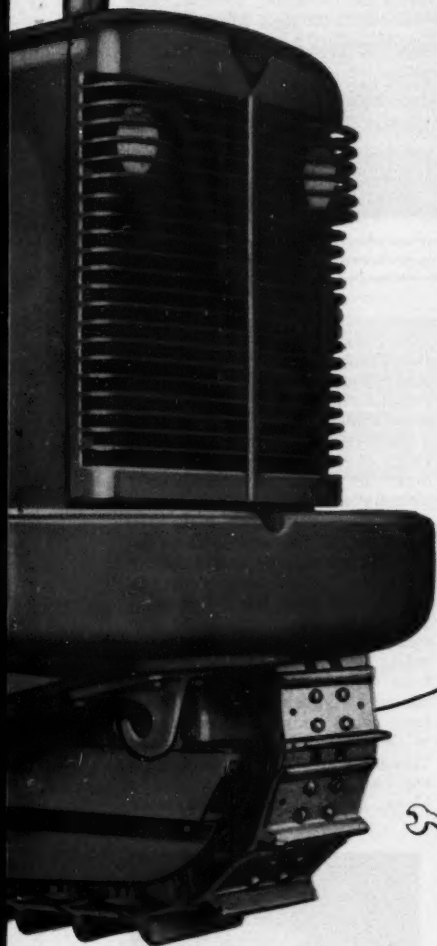


Hydraulic Torque Converter Drive  
175 net engine hp.  
41,000 lb.

• DESIGNED FOR YOUR JOB • BUILT TO TAKE IT • EASY TO OPERATE • EASY TO SERVICE



# EASY TO SERVICE



- ▶ Allis-Chalmers' new tractor line is blazing the way to simpler servicing with time and money savings never before possible.
- ▶ Adjustments are easier . . . lubrication simplified and lube periods greatly extended. Mechanics say these are the easiest tractors they have ever worked on!
- ▶ This all adds up to less down time, more producing time . . . longer tractor life at less upkeep cost.
- ▶ Below are just a few reasons why this **NEWEST, FINEST TRACTOR LINE ON EARTH** is *Easy To Service* . . . besides being built to "take it," easy to operate and entirely new in performance. Get the full story from your Allis-Chalmers dealer.



## TIME-SAVING LUBRICATION DESIGN—

Only a few lube points, easy to get at — **NONE UNDER TRACTORS**. You operate 75 HOURS without any greasing — then only one fitting to hit and an oil change to make. (Only exception, torque converter bearings on HD-20). You lubricate the Positive-Seal truck wheels, support rollers and idlers only once every 1,000 HOURS!



## ACCESSIBLE ADJUSTMENTS—QUICKLY MADE—

brakes, master clutch, steering clutches. No floor plates to remove for any adjustments. Tracks easier to adjust — simple screw adjustment with automatic lock.

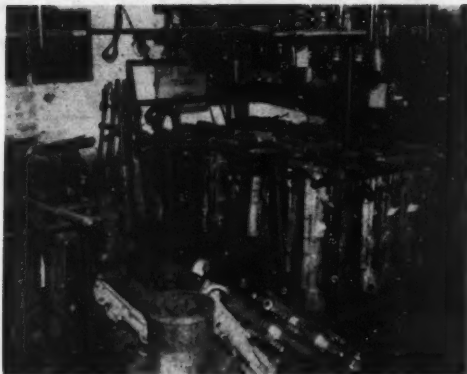


## EASY TO REPAIR—

Engine, master clutch, transmission, steering clutches and final drives can be easily removed and repaired or replaced, without disturbing adjacent assemblies.

*The Newest, Finest Tractor Line on Earth!*

**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



**PNEUMATIC TOOL SECTION** in Central Tool Depot of Consolidated Edison Co. at Astoria, N. Y., boasts variety of air-operated tools. Note racks full of pavement breakers and jackhammers, with drills,



scalers, chippers, impact wrenches, filling dozens of bins (right). Tools run gamut from big jackhammer on bench to small chipper in front of it. Minor repairs are handled here.

## Utilities Have an Enormous Equipment Maintenance Job

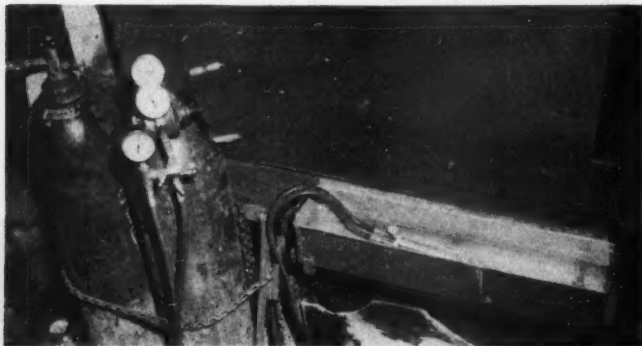
By JAMES CONNOLLY, Associate Editor

OVER TWENTY THOUSAND capital tools and over 2,000 types of expendable tools demand a lot of maintenance, routine and special. Bigger and more complex than any contractor's wildest dream, these represent the contents of a Central Tool Department, four borough distribution centers and 28 tool cribs, one at each station of the vast New York City utility, Consolidated Edison.

To be sure, lots of their tools are specialized and never found in the inventory of a construction company. These include manhole blowers, tube expanders, slitting machines, and the like. On the other hand, lots of others are used in regular construction operations, including pavement breakers, chippers, compressors, welding machines, chain hoists, oxyacetylene outfits, etc., in an almost endless

list. There is a very clear-cut pattern of inspection, maintenance and repair, replacement, storage and distribution.

To give an idea of the complete range of sizes and types of equipment in their inventory, their pneumatic tools run from a huge piston-type drill that takes 110 psi of air, all the way down to the smallest of scaling and chipping hammers that can be concealed in the palm of your hand. Compressors range from portable 30 cfm rigs to big 625's. Hundreds of chain hoists hang in their racks, ranging from ¼-ton full lifts to big 20-ton affairs. Hydraulic jacks vary from small body-and-fender type to Watson-Stillman 500-tonners. Threading machines can handle any size from ½-in. dia tubing to 12-in. pipe. Smith cutters score



**BURNING TORCH** lies in trough of water with pressures on one or more hoses controlled by special set of shut-off valves and gages. Water also detects leaks in triggers, valve seats, stems,



and fittings. Nitrogen is used for all such tests. Acetylene hose, usually subject to 15- or 20-lb pressure is tested here to 200 lb. Note bank of regulators on simultaneous test at right.



**MAJOR REPAIRS** on all tools and equipment take place in huge 153rd St. shop in Bronx; then they're shipped back for reassignment. Note inlet valve welded to casting to prevent shearing.



**ROW UPON ROW** of bins in Astoria tool depot hold every conceivable type of construction tool, ready to go. Everything is palletized, as shown, for easy transfer by fleet of fork-lift trucks.



**ONE CHAIN HOIST** holds another on portable lift rig while mechanic replaces cotter pins and greases gears. Occasionally, special machines are sent back to maker or dealer for repair.

still larger diameters for sleeve connections. Other machines can chamfer concrete, fiber and transite pipe. Hoses run the gamut from aspirator and gas mask size to 8-in. dia pump discharge lines.

The Central Tool Depot in Astoria, N. Y., is the main supply and record control center for Con Edison. Upon completion of a specific job, all tools pass through this depot for preliminary inspection,

minor repair; then to storage racks or out again on re-assignment. Tools or equipment requiring overhaul or major repairs are shipped out to the huge 153rd St. shops in the Bronx. In the case of some specialized tools the depot will ship them back to the manufacturer or his authorized distributor for overhaul and/or repair.

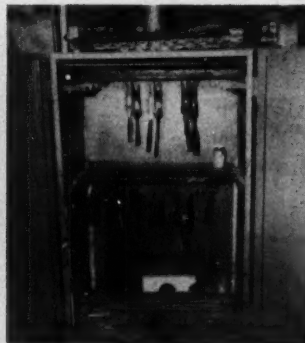
One entire corner of this efficient Bronx shop is devoted to main-

tenance of pneumatic tools. According to the fellow in charge of this department, there's very little that can go wrong with a pavement breaker, chipping hammer, jackhammer or similar tool if it's lubricated often enough and kept out of inclement weather and dampness. He has seen too many contractors' men use them to pry loose stone or sections of pavement, thus exerting strains on the wrong parts and inviting breakdowns. Anvils, hammers and recoil spring breakdowns are understandably frequent because of the very nature of the tools and the incessant pounding they receive, but these are quickly rectified.

To minimize delays and prevent accidents, each time a pneumatic tool is repaired or checked, its hose is also tested and replaced, if necessary. To test it, they plug one end and introduce 80 or 85 psi of air at the other. On larger hoses, a gage helps them to determine any leaks. The second step is to unplug the end and let the air pass through. Flapping sounds indicate a loose lining. If the lining break is near either end of a section of hose, it is slit back beyond the break. If it's near the middle of a



**HAND TOOLS** are insulated with Ruberex in eight consecutive coatings, preceded by crack filler in all voids and holes, then wrappings of linen tape (left). Between applications, screwdrivers, pliers, hacksaws, etc. are hung on pins in drying oven (right).



# LIFELINES

## THROUGH LOW-COST AGGREGATE

THE vast networks of American railroads and highways are the arteries of the nation, carrying the output of factories, farms, mines and forests, providing the lifeblood for national security and progress.

America on wheels rolls on aggregate . . . hundreds of millions of tons of aggregate that must be produced at the lowest possible cost per ton for UNLIMITED CONSTRUCTION of the high speed roadways so urgently needed.

Cedarapids equipment provides American contractors with the means to keep aggregate production costs at lowest levels . . . consistent big volume output, long-life construction, low operating and maintenance costs, and high quality finished products that meet exacting specifications.

Cedarapids equipment brings OPPORTUNITY UNLIMITED to you with bidding advantages you can depend on to beat competition. For complete plants or single units . . . for producing either aggregate or black top . . . see your Cedarapids distributor for details.



## IOWA MANUFACTURING COMPANY

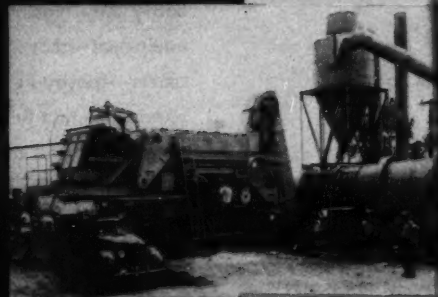
Cedar Rapids, Iowa, U. S. A.



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**THE UNITIZED PLANT**  
fits all aggregate requirements! The four basic units ... primary crushers, crushing units, secondary crushers and wet or dry screening units ... can be used alone or in any combination to produce anywhere from 25 to 250 tons per hour, and more, of any type of aggregate, from riprap to asphalt.



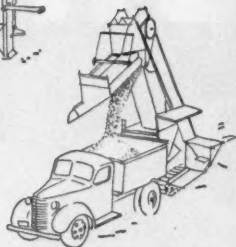
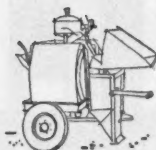
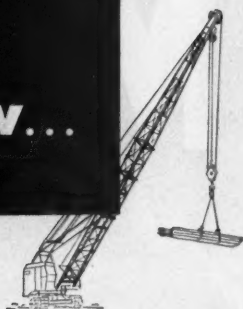
**MODEL "FA"**  
The most portable of the Iowa line of bituminous mixing plants, the Model "FA" is quality built for accuracy of mix and low cost operation on a big variety of work. There's a size and type of Cedarapids plant for every black top job ... the Model "B" for the biggest to the Patchmaster for the smallest.

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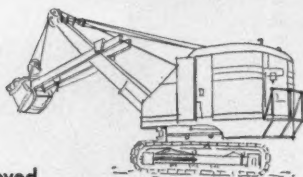
## THE IOWA LINE of Material Handling Equipment Includes:

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you  
know...**



**...that you have the best,  
if your construction machinery is driven  
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**It's true . . . and it's proved**  
by the outstanding dependability and performance of this  
heavy duty, high strength chain. Makers of all types of construction  
equipment—shovels, loaders, cranes, mixers, pavers and many  
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You'll get added performance from your machines by insisting on  
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**CHAINS AND SPROCKETS**

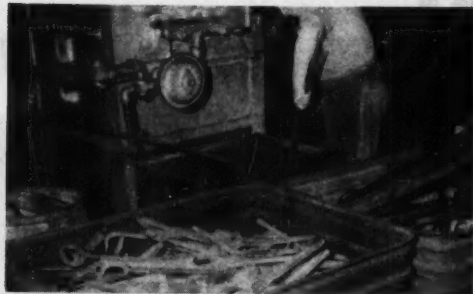
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Springfield  
Tulsa



**BULLPOINTS**, picks, chippers, prybars, manhole drags are sent in by hundreds for tempering and reshaping (left). Gas forges



help speed them back as good as new (right) to four borough tool distribution centers and each of 28 station tool cribs.

long run, they cut it, discard the break section and attach new couplings. One other trick they've learned by experience: They weld the inlet connections right to the casting on paving breakers and jackhammers to prevent loosening up or shearing of threads.

Gas regulators and gages are tested and repaired in another section of the shops, along with torches and accessories. Most important fact is that non-explosive nitrogen is used in all tests. First off, a set of regulators is fitted with a short section of hose containing a screw-type end plug. Pressure from the nitrogen test bottle is introduced to the gages and tube, then the tank valve is closed again and the needles watched carefully for any drop on the high-pressure side. By opening the plug screw and releasing gas from the low pressure side, the intermediate valve is tested for leakage by again watching the high pressure needle for a sign of dropping. On multiple stage Airco regulators a signal button with red sides protrudes from the casing if a leak should develop on the high pressure side. If this happens, don't take chances, they advise. Instead, as they do, replace the high-pressure seat immediately. What about preventive maintenance on gages and regulators? The fellow in charge here says just treat them for what they are—very delicate recording instruments. Also, crack a bottle valve slowly when introducing gas to the line. A quick turn of the valve creates a terrific hammering effect on the regulator. One other thing: A clogged filter will produce a higher-than-normal reading on the high-pressure regulator and then a quick drop will show when it's first used. That's a warning to clean the filter or replace it before damage results.



**ONE OF MANY FEATURES** in main repair and maintenance shop is safe-load weight markings on trolley booms which jut out from alternate columns. Most are equipped with electric hoists.

Oxygen and acetylene hoses are tested with nitrogen, too, at 200 psi, and held for an hour, with no drop allowed on the gages. When torches are repaired, they are connected up through their hoses to a special set of regulators on a nitrogen tank. This special set-up was invented by the section head and allows him to test both hoses together or each singly, to find a faulty valve or fitting by a process of elimination. Torches and their hose fittings are immersed in a pan of water and tell-tale bubbles detect even the smallest of leaks. Soapsuds are equally fast and accurate in determining small leaks on other connections. The pan-immersion trick, however, tests the nozzle, triggers, valve seats and stems, hose-to-torch connections and hose-to-hose connections, accurately.

Maintenance plays a very important part in the every day doings at Con Edison, and cannot be stressed too strongly. Neglected

equipment can cause temporary job shutdowns, accidents, and lots of wasted dollars. Con Edison can't afford any of these, so they keep their equipment in A-1 shape. Go thou and do likewise.

### *Maintenance Tips...*

**TO CHECK** condition of engine oil and oil filter cartridges, Fram Corporation of Providence, R.I., recommends a daily dip stick test. And for such a test they are glad to furnish a 17x22-in. absorbent paper chart, which they call Lubri-graph. This chart contains enough indicator spots to record daily checks on 20 engines for a month's time. Each indicator spot has a printed insert. You simply drop a bit of oil from the crankcase on the spot indicated for a specific engine for a specific date. When the oil is dirty enough to blot out the spot, then it's time to change your oil filter cartridge.

# NO-TURN shuttle haul...



## Dumptors<sup>®</sup>

On every haul cycle, Koehring fast-shuttling Dumptors eliminate slow turns — at the loading unit, at the dumping point, on sharp, "zig-zag" grades. They gain more productive haul time, because Koehring constant-mesh transmission gives the same 3 fast speeds forward and reverse. Here's how much no-turn shuttle operation can increase your production:

## SAVE TURN TIME GAIN HAUL TIME

By eliminating only 2 turns on a 1,000' haul, time studies prove that Dumptors can save 30 seconds every round trip, and increase hourly yardage output over 10% per unit. What's more — fast, easy spotting and 1-second gravity dump keep production high.

Remember, too — top hauling efficiency also means increased shovel output. For double profit protection, team fast-shuttling Dumptors with Koehring heavy-duty excavators. Four sizes: ½-yd., ¾-yd., 1½-yd., and 2½-yd.

# KOEHRING

## COMPANY

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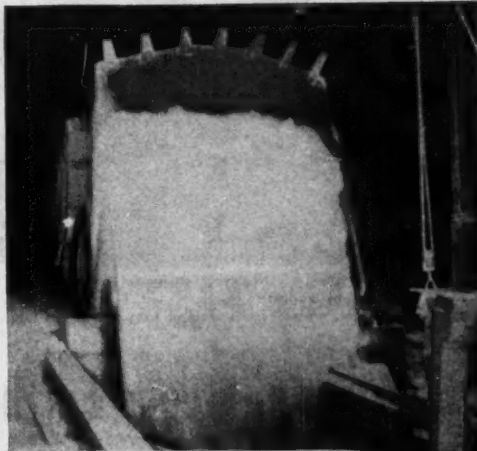
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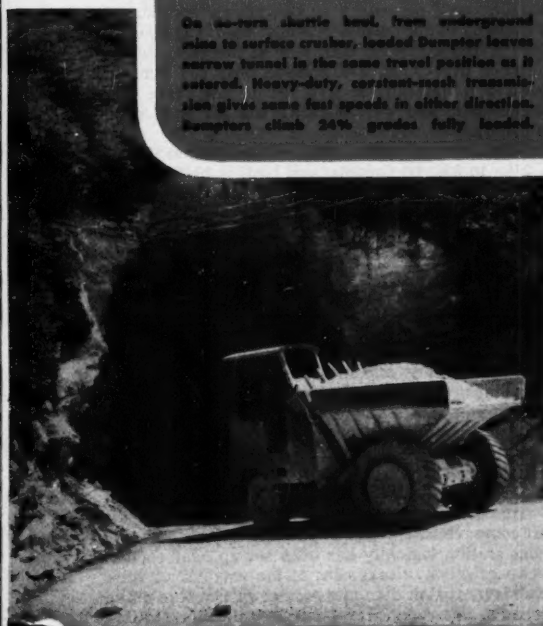
# . in open pits or underground



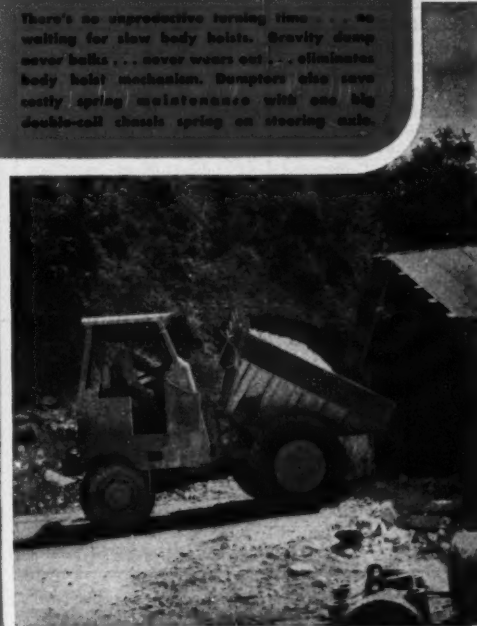
In confined underground operation, Dumper spots fast, close to shovel . . . no need to turn. Big, flared, 8' x 8' body permits loading over either end or sides. Shovel operator has easy-to-hit target, and short swing. Excavator, shown above with Dumper in a Kookring 14-yard 304.



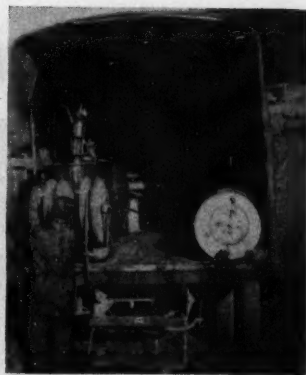
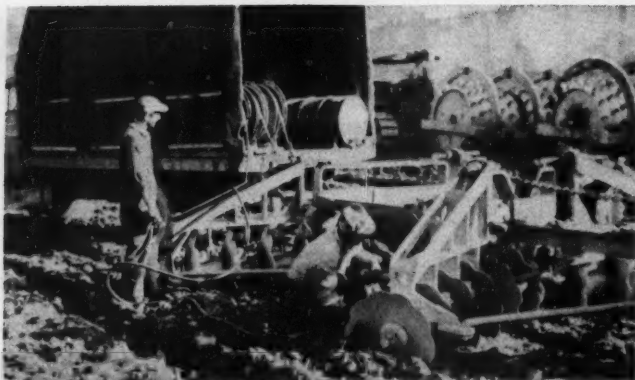
At dumping location there's no slow jockeying around in crowded passageway. Dumper drives up to conveyor, body forward . . . operator hits body release lever . . . gravity dumps 6-yard load in 1 second, and Dumper is ready to head back for next load, without turning around.



On no-turn skid-steer haul, from underground mine to surface crusher, loaded Dumper leaves narrow tunnel in the same travel position as it entered. Heavy-duty, constant-mesh transmission gives same fast speeds in either direction. Dumpers climb 24% grades fully loaded.



There's no unproductive turning time . . . no waiting for slow body hoists. Gravity dump never balks . . . never wears out . . . eliminates body hoist mechanism. Dumpers also save costly spring maintenance with one big double-coil chassis spring on steering axle.



BETWEEN 10-HR SHIFTS earthmoving equipment parked on the dam fill is serviced by lubrication trucks. At left, Rome disk harrow is greased. At right, grease hose is unrolled from one of two lube

trucks. This one is International L-160 carrying Worthington compressor and Lincoln and Alemite greasing equipment, as well as supply of various oils and greases.

## Lubrication Keeps Earthmovers Up at Downsville

BIANCHI, CENTRAL, MUNROE-LANGSTROTH, RUGO DOWNSVILLE DAM DOWNSVILLE, N. Y.									
OILER'S REPORT									
Trucks and Misc. Equip.									
TYPE EQUIP. NO.	REPORT	QT.	LB.	LB.	LB.	QT.	X	X	X
Grease Truck # 1									
Grease Truck #11									
Ford Rack Truck #2									
Fuel Truck #4									
Water Truck # 5									
Water Truck # 6									
Water Truck # 7									
Water Truck #10									
Sterling Dump Truck # 9									
Sterling Dump Truck # 8									
Sterling Dump Truck #12									
Sterling Dump Truck #13									
Sterling Dump Truck #14									
Sterling Dump Truck #15									
Sterling Dump Truck #16									
Grader #1									
Grader #2									
Welder #1									
Welder #3									
SIGNED _____ No. _____ 200 1 0 1-01									

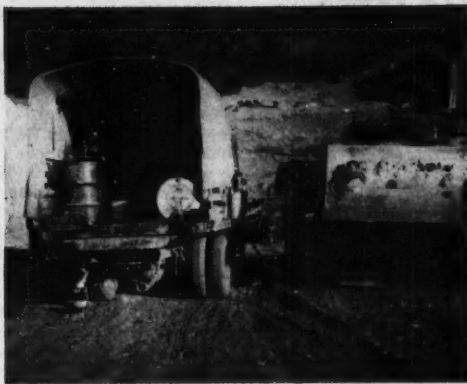
OILER'S REPORT is turned in daily. Fuel quantity goes in "Report" column; back of sheet is used for notation of any repairs or extra attention needed. Similar sheets cover other equipment.

A STRICT ROUTINE for once-a-shift lubrication of earthmoving equipment is holding down down-time at Downsville Dam on the Delaware River's East Branch in New York State. More than 150 pieces of heavy equipment are kept rolling—and dirt flying—by fast moving crews in three service stations and on two lube trucks. One indication of the care given the machines: Of the nearly 400 men presently at work on the project, 65 are engaged in servicing equipment, either as oilers, mechanics or maintenance men.

Earthmoving procedure at Downsville consists of: (1) Loading out of borrow pits upstream; (2) Hauling to two grizzlies, one on each side of the river, where all stones over 5 in. are scalped out; (3) Hauling processed material from grizzlies to the main dam embankment; and (4) Working the fill with disks and rollers.

As this is being written, borrow excavation is with ten 2½- to 3½-yd shovels, and haul is by 50 Euclid 13-yd (struck) wagons. Haul from pit to grizzly is more than 1,000 ft; that from grizzly to fill is over 1,500 ft. Yet, despite the tough double haul and the necessity for processing the dirt in between hauls, daily output is 30,000 cu yd. However, as soon as the embankment is worked up out of the core trench there will be room for more equipment. Then production will swing into even higher gear with the addition of three Euclid loaders and 40 more wagons, which are already parked at the job. The motorized equipment array also includes 25 Euclid 10- and 15-yd end-dump trucks, 25 crawler tractors, four Tournapulls for stripping, five graders and four sprinkler trucks.

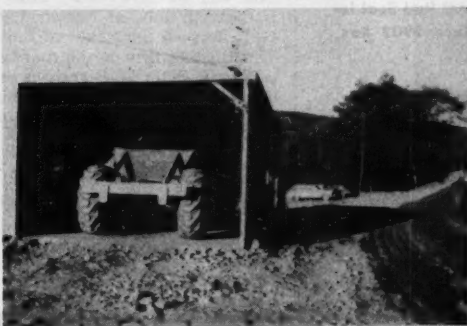
The job runs two 10-hr shifts daily, and all equipment is serviced once a shift. Because the fleets hauling from the borrow pits and those hauling to the dam come closest together at the grizzly, a field service station logically has been set up near each of the two grizzlies to take care of the wagons. A third station is located at the main service shop where major overhauls and repairs are handled. Service stations are drive-through, open-end wooden sheds floored



**OTHER LUBE TRUCK** services Caterpillar D8 bulldozer. This one, with hoses feeding out of side, carries track roll grease, gear oil, chassis and extreme pressure lubricant, detergent oil.



**FIELD SHACK OFFICE** is also storage for lubricants that are piped through wall to service shed. Weekly job consumption now totals 2,400 lb of grease and 825 gal of transmission oil.



**SERVICE STATIONS** to handle Euclid wagons are set up alongside both haul roads from grizzlies to embankment. Complete servicing by two station attendants (right) takes less than 15 min. per unit.



Gasoline pump here is for wagons; another one just outside serves rest of wheeled, high-speed equipment; and single tank truck fuels those rigs that can't get to station easily.

with concrete so maintenance operations can continue even during showers. An attached lean-to serves as an office and for storage of grease and oil, while fuel is tanked outside.

Getting the wagons into the station for servicing is quite a routine. At the beginning of the shift, the foreman on the haul to the fill gives the service man a list of his Eucs. Because the station is alongside this haul road, the service man can just signal the units in, one at a time, checking his list to make sure none is missed. Because the haul road from pit to grizzly does not pass the station, both the service man and the load checker at the grizzly are given a list of the Euclids in this fleet. When the station has finished servicing all the fill-haul wagons, the load checker sends one of the pit-haul machines to be done. The checker gives the driver of this wagon a red flag, which he returns when his servicing is completed. The operation is repeated for each unit in the fleet, so there is no bunching-up at the service station. It takes less than 15 min for the two-man service station crew to give a Euclid its quota of fuel, grease, oil and water.

Two lubrication trucks with three-man crews handle the rest of the equipment on the job. First, in the 1½ hr between shifts, both trucks service the tractors, rollers and harrows parked on the fill. Then

they split up to take care of the scattered equipment. One services shovels, tractors and rear-dump trucks; the other services graders, scrapers and miscellaneous machines. A Hornell (N.Y.) General Tire & Rubber Co. agency truck checks all tires on the job.

Oil in the machines is changed every 120 hr, as are oil filters and air cleaners. Admittedly, the latter should be cleaned daily, but time does not permit. Instead, haul roads are sprinkled continually to minimize dust. Items that are serviced once a week are scheduled for one certain day for all machines to insure their being done at the proper interval. For example, every Monday, all Euclid clutch throw-out bearings and brake anchor pins are given one shot of grease from a hand gun only, which prevents dangerous over-lubrication. Every Saturday, batteries are checked.

Complete records are kept of each piece of equipment—hours worked, service given, repairs needed and made, fuel and lubricant consumed. All foremen turn in time cards for machines in their charge, while oilers' report sheets detail the other information. Ed Thain, lubrication foreman, correlates the data and posts it daily on charts so he can tell at a glance the maintenance status of each unit. And he can quickly spot a machine that is using more than its share of fuel or lubricant and find out why. A daily report

# LOOK WELL TO THE ENGINE OF THE MACHINE



## CONTINENTAL RED SEAL POWER

When choosing mechanized equipment for the construction industry, pay special attention to the power plant. That's good advice at any time, and extra good today. The manpower shortage has hammered home the need for dependable machines—and even the best is only as dependable as its source of power . . . The presence of a Red Seal engine in vehicle or specialized equipment is an added assurance of user satisfaction over the years, for Continental Red Seal is truly specialized power. Continental's policy ever since 1902 has been to build each engine expressly for its work. Red Seal commercial models, ranging from  $\frac{3}{4}$  to 270 horsepower, are built to more than 1,000 different specifications. And every model is engineered as an integral part of the equipment which it powers . . . You can place full confidence in the product of the manufacturer who has chosen Continental Red Seal as the heart of his machine.



FACTORY-AUTHORIZED SERVICE AND GENUINE CONTINENTAL RED SEAL PARTS AVAILABLE FROM COAST TO COAST

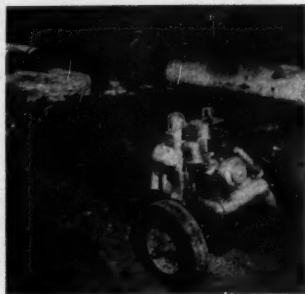
**Continental Motors Corporation**  
MUSKEGON, MICHIGAN

listing each piece of equipment and its consumption is sent to the main project office for cost control.

Downsville Dam, a rolled earth structure with concrete core wall, is being built for the New York City Board of Water Supply to divert water from the Delaware to the Hudson River watersheds (see article on page 46.) It is 2,450 ft long, 200 ft high, and calls for 6,700,000 yd of rolled fill plus 1,000,000 yd of rock embankment. For the Board, N. L. Hammond is department engineer and B. J. Sullivan is division engineer.

Four Massachusetts firms hold an \$18,000,000 contract for earthmoving, excavation of waste-water channel, and construction of spillway and control works. The group consists of Carlo Bianchi & Co., Inc., of Framingham; Central Construction co., of Lawrence; Munroe-Langstroth Inc., of Norwood; and G. L. Rugo & Sons Inc., of Boston. The Bianchi firm is the managing company. Peter M. Bianchi is project manager, Tom Coyne is general superintendent, E. H. Richardson is chief engineer, and George Dickerson is master mechanic.

### Maintenance Tips...



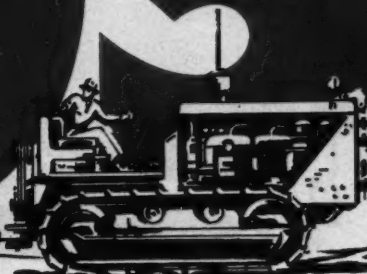
**HANDY PORTABLE GENERATOR CART** sports sponge-rubber-filled puncture proof tires for operating over rough terrain. Fabricated in the welding shops of the Alex Robertson Company, Los Angeles pipeline contractor, this streamlined wagon transports the generating equipment for pipeline buffing and grinding operations. The unit is a 110-v dc generator which operates a 1/3-hp grinder for cleaning pipe joints before welding. The U-shaped storage rack holds the grinder when not in use.—From Lincoln Electric Co., Cleveland, Ohio.



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*4 years in the field*  
*4 years of proof*

**on automatic  
hard-facing of  
tractor rollers  
and idlers.**



STOODY 105 was the first hard-facing alloy developed for application on tractor parts by the automatic welding process. Its value in increasing equipment life is now proved by four years actual use in the field. Stody 105 possesses an alloy content which insures *true* hard-facing properties, longer wear! Because of its low cost and speed of application, coupled with uniformity and excellent wear resistance, STOODY 105 is the accepted standard wherever automatic hard-facing is utilized. Try Stody 105 yourself. Shops equipped to rebuild tractor parts by the automatic process are now located in most areas. Names will be provided upon request or your Stody dealer will be glad to refer you to your nearest source.

## **STOODY COMPANY**

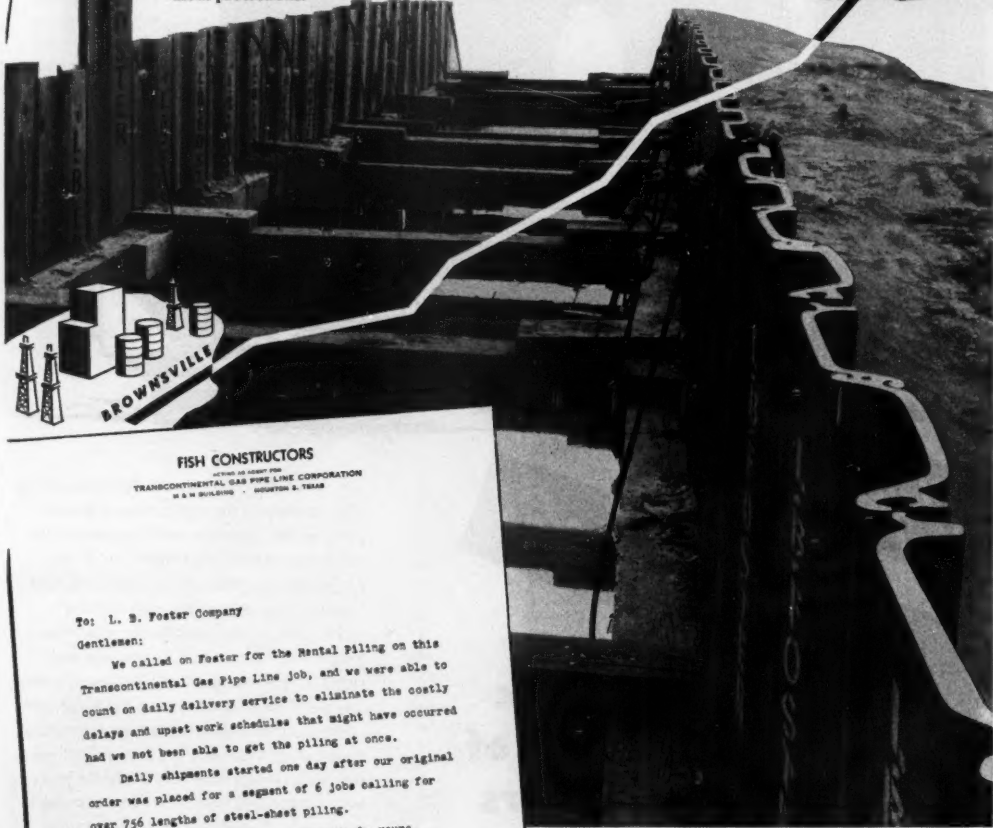
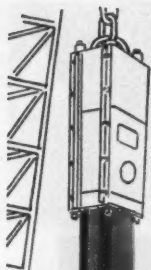
11972 East Slouson Avenue, Whittier, California

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says: WALTER J. NOLAN, Division Superintendent, **FISH CONSTRUCTORS**

Fish Constructors, acting as agent for the entire Transcontinental Gas Pipe Line Project, sub-contracted the New York Area Spread of this job to the Oklahoma Contracting Corp. (Tulsa). They specified Foster's Rental Piling to meet the difficult job demands of this big 30-inch main line and sales laterals that had to be cut through a highly industrialized area. It was a real "pressure" job—involving numerous road crossings, tunneling under highways and railroads, ground water conditions, and embankment protections.



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To: L. B. Foster Company  
Gentlemen:

We called on Foster for the Rental Piling on this Transcontinental Gas Pipe Line job, and we were able to count on daily delivery service to eliminate the costly delays and upset work schedules that might have occurred had we not been able to get the piling at once.

Daily shipments started one day after our original order was placed for a segment of 6 jobs calling for over 756 lengths of steel-sheet piling.

Very truly yours,  
**FISH CONSTRUCTORS**

**RENTAL Pile Hammers and Pile Extractors**  
Send for **FREE PILING WALL CHART # CM-3**

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Foster's Piling Rental Service turns construction "headaches into headstarts" that mean extra economy and extra efficiency. You can always count on the exact lengths and exact sections of interlocking steel sheet piling that the job requires.

# Pumps and Vibrators... ...Forgotten Equipment

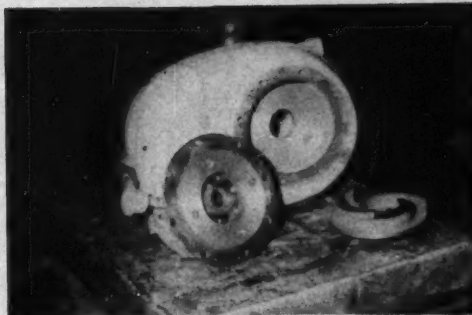
FOR SOME UNEXPLAINABLE REASON, pumps receive less care than any other type of small construction equipment out on the job. At least that's the consensus of opinion at the Maspeth, Long Island, repair shops of Turner Construction Co. They trace it principally to divided responsibility.

Formerly, when only one or two pumps were used, and no pump engineer was required, one laborer placed it originally, another may have been responsible for gassing and greasing it, and still others to start it up, shut it off or relocate it, as the need demanded.

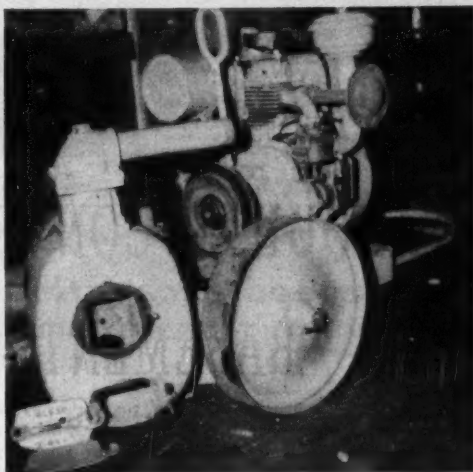
Without a moment's hesitation, Turner shop mechanics will tell you that lack of grease or use of the wrong kind on air seals is the number one reason for pump failures. This is the case not only with some of their own machines, but also with those of others with whom they are occasionally in contact. If waterproof grease is mistakenly forced into the air seal fitting (or no grease at all) the softer brass fitting will wear down in friction with the steel wearing surface it touches. These steel facings have a circular groove with a small hole for injection of grease. When no lubrication is provided, a circular rib soon appears on the brass fitting which fits perfectly into the circular groove of the steel casting. From then on you can't force any grease in, even though you think to do it.

Next in number of pump breakdowns is a plugged recirculating chamber. Cement-filled water, small lumps of aggregate which pass the strainer, shavings and the like, all tend to lodge there, and often set up and densify when the pump is shut down for the night. Sometimes recirculating chambers become so badly plugged, that only a hammer and chisel—and lots of elbow grease—will put them back into operation.

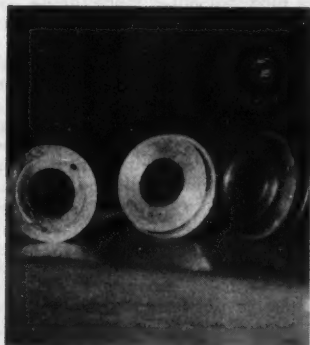
Through the years, Turner's shop mechanics found that on certain types of pumps wearing plates on either



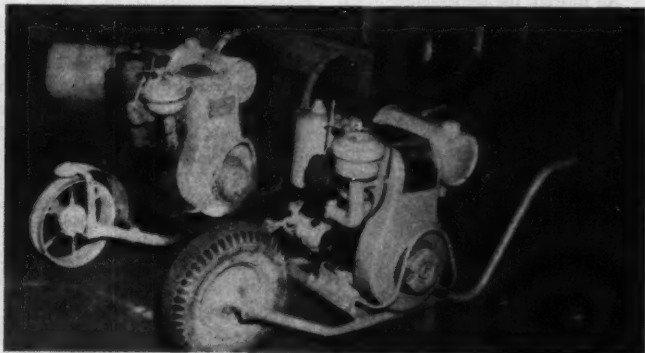
SOME MANUFACTURERS do not make wearing plates for either side of impellers, resulting in less efficiency as castings wear down, in which case Turner Construction Co. mechanics make their own.



RECIRCULATING CHAMBER on this Jaeger pump is clean as a whistle, with new gasket cut to match clean-out gate. Plugged chambers will stop pump and possibly cause major breakdowns.



PROOF OF WHAT HAPPENS to pump air seal when not greased or wrongly packed with waterproof grease. Left to right: Steel fitting with grease groove, new brass fitting, old one with rib worn in.



BEFORE AND AFTER with a vibrator engine and pump. One by one they're all completely overhauled, even to new rubber tires, in Turner's Maspeth, L. I. shop.



**MOVING DIRT** from basement excavation direct to dump truck with gas engine driven Farquhar 334-T Conveyor saves time and money for contractors . . . back-breaking work for men.

## FARQUHAR CONVEYORS

### *speed excavation of*

## BASEMENTS

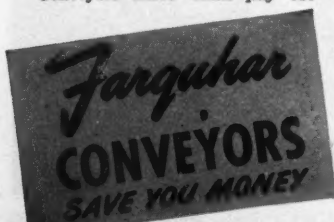
This versatile Farquhar Trough Conveyor is the best workman in any job . . . removing dirt from excavations . . . loading and unloading trucks . . . moving bricks, blocks, sand, gravel, aggregates, all types of building materials horizontally or at an elevation.

All through the construction industry you'll find Farquhar Conveyors replacing costly old-fashioned hand methods with speedy, streamlined mechanized operations . . . saving *time, manpower, money!* For instance, tests prove that Farquhar Conveyors *more than pay for*

*themselves* by eliminating the need for costly ramps and scaffolding in moving wet concrete from ready-mix trucks to forms!

Farquhar offers you a complete line of conveyors for portable, semi-permanent or permanent use, to handle any and all kinds of loose or packaged materials. Be sure to get full information *now* on how Farquhar Conveyors can help you *keep costs down* even though labor and material expenses may go up.

**WRITE** us about your problem *today* . . . we have the know-how to help you solve it quickly, efficiently, economically! A. B. FARQUHAR Co., Conveyor Div., Dept. V-26, 142 N. Duke Street, York, Pa., or 618 W. Elm Street, Chicago 10, Ill.



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CONVEYOR LINE**

side of the impeller wore down enough to slow pump volumes. At first no corrective measures seemed possible, since the wearing surfaces were actually part of the pump casting. Now, however, they turn out steel wearing plates by the dozens in all necessary sizes. These are fastened to the casting with four countersunk brass screws (for easy removal) and can be replaced in a matter of minutes. With a two-plate replacement, vacuum readings jump to 26, 27 or 28 lb; in some instances better than when the rig was new.

Always place a pump, especially the centrifugal type, as near its source of supply as possible. Pumps are designed for a short suction and long discharge. Reversing the process makes them work much too hard.

Smaller pumps may have two-cycle engines, such as the Homelite type, and men responsible for gassing such rigs must remember not to make it burn gasoline alone. Light oil (#30 SAE) should be mixed with the gas at a rate of 1/3 or 1/2 pint to a gal.

#### Care of Vibrators

Vibrators, too, aren't treated as delicate pieces of machinery. All too often they're dropped or banged enough to injure the heads, or left running needlessly until something breaks or unnecessarily wears out. Avoid sharp kinks or bends in vibrator hoses, and with air-powered rigs, hang them head up and handle down to remove any condensation. Never use a pneumatic vibrator without an oil dispenser on the supply line. Be careful with hydraulic types not to hook up pump and return lines the wrong way, thus sending high pressures down the line between the core tube and outer fabric lining, and using the heavy core for low return pressures.

Air-cooled engines, whether they're driving pumps, vibrators, mixers, or any other piece of equipment, must be kept clean. Many times the plugs and fins become covered with sawdust, dirt, sand or cement with the result that the engine runs too hot and sometimes won't shut off or idle down when you want it to.

Thorough a carefully planned program of responsibility and education of workmen, Turner Construction Co. has minimized its breakdowns and repairs. Larry Hahn is shop superintendent under supervision of Turner's New York office.



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give you big capacity + versatility + economy



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*Make your next  
motor grader an*

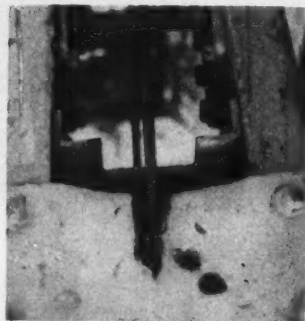
# ADAMS



**WIRE ROPE** will stand only so much abuse. Look at the beating this scraper cable is taking through careless overloading. That chunk of clay wedged into the sheaves won't do any good at all.



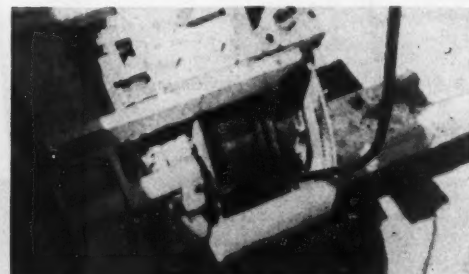
**GUARDS ARE ALL RIGHT**, except when they chew up rope like these are doing. Look at the way those pipes have been worn through, and figure out how much loss of rope life it took to do that.



**IT TOOK A LOT** of sawing by wire rope to cut this channel into boom plate. That notch represents a big loss of rope life.



**SHORT LIFE** can be expected from any wire rope wound around drum in this sloppy fashion.



**TROUBLE AHEAD!** A devastating jerk on line is certain wherever drum winding is as slack as this. Rope is also criss-crossed, which means mashed strands if load is heavy.

## Wire Rope... So What?

By HAROLD W. RICHARDSON, Editor

Neglect of this important construction accessory is costing contractors thousands of dollars, but sensible care and attention will pay off well. Here's the dope according to William C. Russell, chief wire rope and product engineer of The Macwhyte Company, as related to us in an interview.

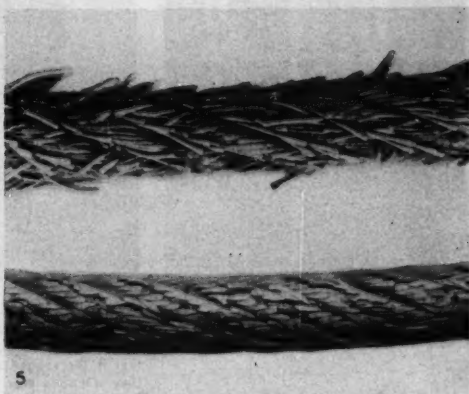
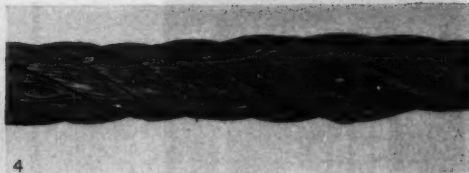
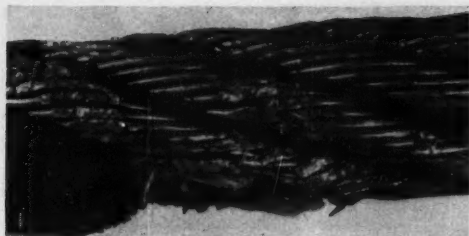
**THE SMART CONTRACTOR** regards wire rope as a vital part of his construction plant, deserving just as much attention and care as any other equipment item. Yet, as we travel from job to job around the country, we find all too many construction men who look upon the stuff as a mighty expensive nuisance, always wearing out or breaking, forever needing replacement, and messing up the warehouse with rusty snarling coils.

To get the lowdown on wire rope, how it should be selected, used and taken care of, we sashayed out to Kenosha, Wis., and had a long chat with William C. (Bill) Russell, veteran chief engineer of the Macwhyte Company, one of the largest rope manufacturers in the country. Any contractor who will heed the advice of Bill Russell, or that of any good wire rope engineer, will find his rope troubles disappearing and his costs for this item going way down. From here on, this is Bill Russell's story.

Abuse and neglect are enemies of wire rope life, he says. Abuse includes improper storage, unreeling and reeving up, haphazard wrapping on the drum, rubbing against guides and guards, running over worn or wrong-size sheaves, and careless operation. Neglect starts and ends with lack of lubrication.

But let's start at the beginning and follow Bill Russell's recommendations through the whole works.

- **Rope selection**—Every wire rope manufacturer turns out hundreds of different sizes and types, each designed for a specific purpose. Wire rope varies in kind of steel used, in number of strands and wires in each strand, in arrangement of wires and strands, in



**HORRIBLE EXAMPLES** of beat-up wire rope. Troubles were: (1) Gross abuse, resulting in chewed-up-rope long before wires show any real signs of wear; (2) Lack of lubrication caused this rope to become rustbound internally; (3) Drum abrasion caused this failure. The rope was scuffed over and against previous wraps on a flat-

faced drum; (4) This rope was crushed and flattened by being unevenly wound time after time on the drum; (5) These two views indicate the difference between non-preformed and preformed (bottom) wire rope subjected to same wear. Note how the non-preformed wires fly out when broken.

core material and construction, and in method of forming—preformed and non-preformed.

There is no such thing as an all-purpose wire rope for construction. Most popular types are the 6x19 (6 strands of 19 wires each) plow steel rope with fiber core for ordinary work, and with wire rope core for heavy duty. Where more flexibility is desired, the 6x37, 6x41 and 6x46 types are suitable. Bill points out the folly of trying to standardize on one type for all contractors' needs. It is cheaper in the long run and much more satisfactory to select the type designed for the specific installation. He urges every wire rope user to take advantage of the engineering advice offered by distributors and rope manufacturers.

However, Russell does recommend buying pre-formed wire rope for all construction purposes. He says the higher excess first cost over non-preformed rope will be paid back many times in longer and more efficient service. In every case wire rope satisfaction and efficient use starts with selection of the proper type and construction.

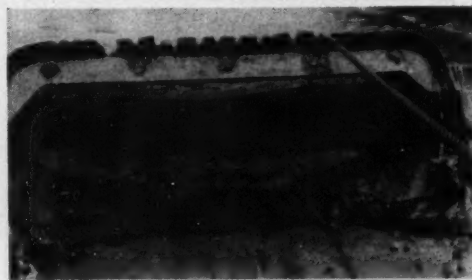
• **Storage and handling**—Wire rope is a steel product, and as such is subject to rust and corrosion. Therefore, it makes sense to store both new and used rope under cover, protected from rain and moisture. Used wire rope should be kept coiled up, free of twists and kinks, and certainly should not be thrown on the warehouse floor to be covered up by a lot of heavy junk.

Improper unreeling from the spool or uncoiling is a frequent source of damage to wire rope. Never remove rope from reel or coil by throwing it off in loops, for you twist and kink it by so doing. Jack up the reel on a horizontal axle so the rope may be pulled

off as the spool revolves. If you are going to reeve up the drum on the rig from the top, pull the rope from the top of the reel; if the drum is wound from the bottom, the rope should be paid off the bottom of the reel. Remove rope from coils by rolling the coil along the ground.

In handling the rope, keep it straight and free from kinks or loops. Once a kink is pulled tight, the rope is permanently damaged at that point and nothing can be done about it. Bill Russell says little time is saved in mishandling wire rope, but that contractors actually lose thousands of dollars right here. Handling rope so that it kinks is just plain dumb in his opinion.

Highly important is the economical length of wire rope to be cut off the reel or coil. Don't make it too



**SCRAPER BUCKET DRAGLINE** operation is tough enough on wire rope without subjecting line to further damage by dragging it over bucket rim until it saws out notches like these.



**WATCH IT!** Jumping drum grooves like this is bad for any type of wire rope.



**OVERHANGING CHEEK PLATES** coupled with slack rope operation are to blame for the wear on this bucket bail. It is obvious that if the ragged edges are not rewound they will soon tear out wires and ruin the rope. Such neglect is expensive.



**HOW LONG** do you think a good piece of wire rope will last, operating through a sheave in this condition? Proper inspection of sheaves and rope would have revealed this situation long before sheave wear became detrimental to life of wire rope.

WIRE ROPE SERVICE RECORD					
Location _____			Job No. _____		
<b>MACHINE DATA</b>					
Make _____		Number _____			
Shovel . . . . . <input type="checkbox"/>		Drag Line . . . . . <input type="checkbox"/>		Crane . . . . . <input type="checkbox"/>	
Trench Hoe . . . . . <input type="checkbox"/>		Use of Rope _____			
Shovel	Shovel	Drag	Drag	Boom	Clam
Hoist	Crowd		Hoist	Hoist	Holding / Closing
<b>WIRE ROPE DATA</b>					
Rope Users Order No. _____			Date _____		
Make _____		Reel No. _____			
Length _____		Construction _____			
Diameter _____		Preformed . . . <input type="checkbox"/> Non Preformed . . . <input type="checkbox"/>			
Grade _____		Long Lay . . . <input type="checkbox"/> Regular Lay . . . <input type="checkbox"/>			
		Hemp Core . . . <input type="checkbox"/> Independent Wire . . . <input type="checkbox"/> Wire Strand . . . <input type="checkbox"/>			
<b>WIRE ROPE SERVICE</b>					
	Date _____	Material Moved	Yards <input type="checkbox"/> Tons <input type="checkbox"/>		Kind of Digging or Location _____
Installed					
Cut or Turned					
Cut or Turned					
Cut or Turned					
Cut or Turned					
Cut or Turned					
REMOVED		TOTAL			
Remarks _____					

Form 222 Courtesy of MACWHYTE COMPANY, Kenosha, Wis.

**SERVICE RECORD CARD** will help you keep track of wire rope performance on every rig. Data on daily output of machine are recorded on reverse side of card.

short, Bill warns, or you won't have anything left for cutoffs at the drum end to permit shifting the rope away from points of heavy wear, and later you'll be discarding long lengths of unworn rope. And don't make it too long, he again warns, or you'll pile up the excess length on the drum which cuts down service materially. Keep in mind, too, that the most economical length for your specific installation may be different from the original length supplied by the equipment manufacturer.

• **Reeving Up**—When reeving up, watch the rope as well as the machine, Bill advises, and you'll eliminate a lot of possible kinking. See that the rope winds evenly on the drum, and that it runs free through all sheaves.

You won't get full efficiency from wire rope unless it is properly attached. Zinc-filled sockets develop 100% of the rope's breaking strength when properly formed, but this type drops as low as 25% if babbit

(Continued on page 99)

DAILY RECORD								
For Month of _____					Year _____			
DAYS	Number of Hours				Number of Cubic Yards or Tons			
	First Shift	Second Shift	Third Shift	Total Hours	Material	First Shift	Second Shift	Third Shift
1								
2								
3								
4								
5								
6								



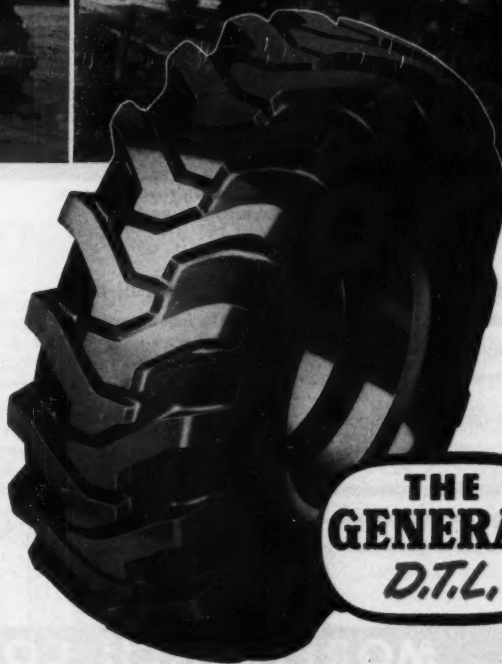
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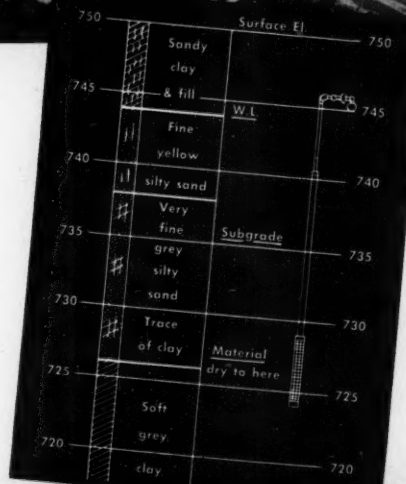


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(Continued from page 96)

metal or lead is used in place of zinc. Wedge-type sockets develop about 80%, as also do clips when correctly installed.

Clips must be placed with the U-bolt over the dead end of the rope and the base against the live end. All theories about staggering clips for greater strength have been proved cockeyed by tests. Recommended minimum number of clips:  $\frac{1}{2}$ - through  $\frac{3}{8}$ -in. rope, 3;  $\frac{3}{8}$ - through 1-in. rope, 4; 1  $\frac{1}{8}$  in. through 1  $\frac{1}{2}$  in., 5; 1  $\frac{1}{2}$  through 1  $\frac{3}{4}$  in., 6; 2 through 2  $\frac{1}{2}$  in., 7; 2  $\frac{1}{2}$  in., 8; over 2  $\frac{1}{2}$ , 9.

• **Operation**—Bill Russell really got riled up when we discussed operation of equipment, for here, he says, is the greatest abuse of wire rope through carelessness. Careless operation often starts with improper spooling on the drum. Any criss-crossing of the rope on grooved drums will cut or crush the wires and will invite further trouble right off the bat. If the rope repeatedly jumps out of the drum grooves, the trouble may lie in letting the drum run too free, or perhaps the rope is too stiff for the job. Both situations can be easily corrected.

Jerking and snapping of the line is a cardinal sin in Bill's eyes. Jerking often results in a fouled-up drum, and always means putting impact stresses into the rope beyond its normal working stress.

Overloading abuse is another one of Bill's pet peeves. Sure, he points out, wire rope has a factor of safety of 4 to 6 on construction equipment. But the rope can be permanently damaged by stressing beyond the elastic limit of the wire, long before the line actually breaks from overload. The manufacturer's definition of safety factor is based upon the rope operating at rated speed and power. For maximum rope life, the average loads should be held within the range of 2/3 to 3/4 rated load. Consideration must be made of the starting and impact loads, too. Both electric and diesel power is capable of 25% starting overload. Impact loads, and those due to inertia of the drums and gears may run as high as 150 to 200% of maximum stalling torque of engine and can easily break a new rope. Friction clutches should be adjusted to give the rope a break—not to break the rope.

Therefore, it is wise to start easy in picking up a heavy load. A little common sense and care in operating equipment will not only great-

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**MALSBARY Model 250** gives you plenty of soap, water, and heat at pressures up to 250 lbs. . . plus instant use of any of these 5 quick-cleaning actions:

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**High Pressure Cold Water**—300 gals. per hour at 250 lbs. pressure for cold rinse or rapid removal of caked mud and dirt.

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**Low Pressure Wet Steam**—for de-gassing tanks & heating purposes.

**Low Pressure Warm Water**—up to 300 gals. per hour for hand washing trucks and equipment.

**Only Malsbary, with its patented pumping system, gives you all 5**

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The **MALSBARY 250** blasts away mud, dirt and grease before their abrasive, corrosive action slows down hourly output and causes expensive repairs. With a Model 250 Fredrickson & Watson Construction Co., long-time users of Malsbary cleaners, cleans the tractor shown above in 2 hours or less; conventional steam vapor cleaners require 4 to 8 hours.

Investigate the 250 Cleaner NOW. It has capacity for 5 hours continuous cleaning. Simple, rugged, dependable construction; free from trouble-making gadgets. Oil or gas fired; stationary, portable or trailer mount. Ask for a demonstration on your job. Call our representative TODAY for name of nearest Malsbary distributor, or write us.



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ly increase the life of the rope, it will save wear and tear on the equipment as well.

• **Inspection and maintenance** — Bill Russell says there are no hard and fast rules for inspection of wire rope. They used to put out inspection manuals, calling for replacement when a certain number of exposed wires within a certain distance were broken. But with the variety of uses and services, plus corrosion and neglect, such advice had little practical value. So today most rope manufacturers encourage inspection on a common-sense basis, believing that anyone experienced in rope use can tell by careful inspection when the line should be withdrawn from service. Inspection of sheaves and guards is necessary, too. Worn sheaves are deadly to rope life.

Maintenance of wire rope means two things—shifting the points of wear by cutting off drum ends or by swapping the rope end for end, and by lubrication. Bill points out lack of lubrication is the most common neglect of rope. Most wire rope is lubricated internally as it is made. Use and exposure works or dries out this oil, necessitating replacement in the field. There are many methods of applying lubrication, such as vertical or horizontal grease boxes through which the rope runs, application by brush, leather gloves, drip, or by spraying.

### Three Lubrication Rules

Russell has three rules for wire rope lubrication: (1) Use a light oil that will penetrate before being wiped off or absorbed by surface dirt; (2) use only a little at a time so it will not run off, resulting in waste and messing up the equipment; (3) apply frequently to maintain the protective film. He points out the oil should work into the strands to combat internal friction. Even drag ropes on draglines should be lubricated, although formerly the procedure was discouraged. But modern thinking is that voids in the rope should be filled with oil, otherwise grit and internal friction will shorten the rope life.

Russell supplied us with the accompanying photographs of flagrant wire rope abuse. It will pay you to study them and do thou not likewise. Surely, in these days of steel shortages, equipment shortages and pressure on increased production, it will pay you well to give careful attention to your wire rope.



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To The Personnel of the Drilling and  
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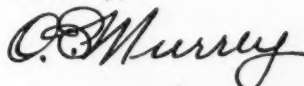
A situation has recently come to our attention that you've undoubtedly known about for some time. Generators, light plants, and welding units are becoming increasingly hard to get. A critical materials shortage in the metals used in the manufacture of such items is definitely in existence and replacement is daily becoming more difficult.

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On the reverse side of this page we've tried to give you some meaty, factual information concerning the plant. All we ask is that you read it... and then look over your own needs.

Our representatives will soon be in the field. If, after reading this material, you would like for one of them to call and give you more detailed information on the Beacon plant, please detach the card below and mail it to us. Understand that this does not commit you in any way.

Sincerely,

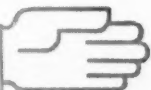


O. E. Murrey, President  
Midwestern Engine & Equipment Company



For more detailed, first-hand information direct from a Midwestern representative — **without obligation** — mail the coupon opposite to us today.

TURN PAGE  
FOR MORE  
INFORMATION



MR. O. E. MURREY  
Midwestern Engine & Equipment Company  
105 N. Boulder, Tulsa, Oklahoma

Dear Mr. Murrey:

I'm interested in discussing the Beacon Light Plant with your representative without any obligation to our company. Please schedule his visit with me between \_\_\_\_\_ AND \_\_\_\_\_

(date)

(date)

\_\_\_\_\_  
(name)

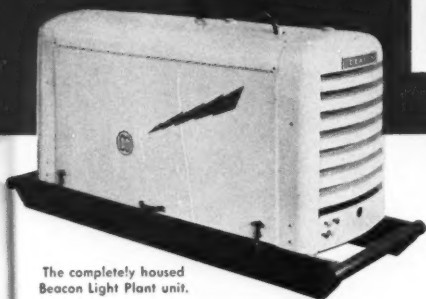
\_\_\_\_\_  
(position and company)

\_\_\_\_\_  
(address)

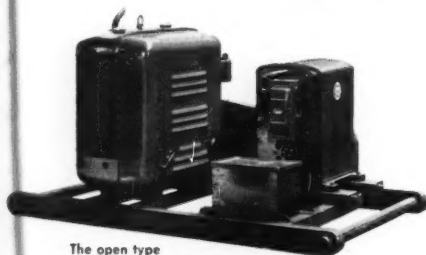
# No Generator Burn Out...

*with the*

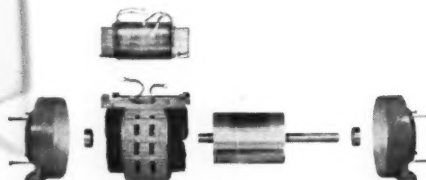
# BEACON LIGHT PLANT



The completely housed  
Beacon Light Plant unit.



The open type  
Beacon Light Plant unit.



Only 7 major parts to the  
Allmand burn-out proof generator.

**GENERATOR:** The Allmand Brushless Generator, used in the Beacon Light Plant will **not** burn out. This generator operates without brushes, slip-rings, or commutator. The only moving part is a permanent magnet rotor which spins on sealed ball bearings requiring no lubrication. The burn-out proof armature is of all-welded construction and contains no wire. It is wound with  $\frac{3}{8}$ " solid copper rod capable of carrying three times the rated output of the unit. Available in 3, 5, 7, 10 KW ratings.

**ENGINE:** All Beacon Light Plants are powered by Continental Red Seal liquid cooled industrial engines. Models available for Diesel, Gasoline or Natural Gas fuel consumption. Units are engineered to run at slow speeds for maximum engine life with ample reserve power to handle heavy overload conditions.

**USES:** The Beacon Light Plant has been designed to handle all types of industrial lighting and welding requirements. The skillfully designed current control produces a stable, quiet, smooth arc that strikes instantly on all heats. Immediate voltage recovery makes arc easy to strike and maintain.

**FLEXIBILITY:** Midwestern offers the Beacon Light Plant in both open type and completely housed units. Heavy skid mountings increase portability and give longer life to unit.

✓ Contrast the simplicity of the Allmand Brushless Generator, at left, with the conventional type generator and its numerous trouble-giving parts.

DROP THIS CARD IN AN ENVELOPE



*and Mail Today*



## MIDWESTERN ENGINE & EQUIPMENT CO., INC.

105 N. Boulder  
15 S.W. 29th St.

TULSA, OKLAHOMA  
OKLAHOMA CITY, OKLAHOMA

Phone 3-4113  
Phone 2-2527

### *What a Personal Call Can Show You*

How the Beacon Light Plant can save money on the job.

The operation of the burn-out proof generator and why it far outlasts the conventional unit.

The number and variety of models available to suit your specific needs.

Specific prices and shipping data on the Beacon Plant.

# Simple Psychology Saves Cranes

CRANES PUT OUT ON RENTAL often take more of a beating than those working directly for a contractor-owner. But New York City's Gerosa Crane Service Inc., which owns a 28-unit fleet of hard-working rental rigs, keeps its machines in top-notch shape by following two primary rules — Keep 'em clean; and keep 'em well lubricated. The key to compliance with these rules is just a matter of simple psychology. It works like this:

From job to job, wherever possible, Gerosa assigns the same operator and oiler to one crane. That way, the crew thoroughly knows the machine's capabilities and develops a feeling of pride and possessiveness toward it — it becomes "our" machine, and therefore is not abused. This pride is fostered in great measure by the fact that a crane is not allowed to

leave the home yard until it is in perfect condition, spotless inside and out, and gleaming with a new coat of paint. The crew likes to keep their crane immaculate, and does. The resultant advantages are threefold:

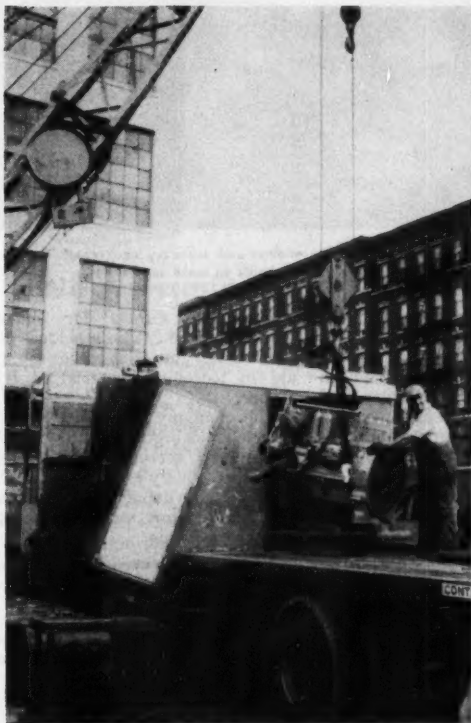
1. *Safety for themselves*—With the machinery deck kept clean, for example, there is less slipping hazard.

2. *Long life for their machine*—Thorough cleaning of the rig assures complete inspection that catches minor troubles before they grow large. Also, there is no dirt to hide defects.

3. *Advertising promotion for the company*—The bright paint is an eye-catcher that focuses attention on the machine and company name, both on the job and in transit.

For lubrication, Gerosa follows the manufacturer's recommendations to the letter. The oiler is guided by the crane service manual, which he must keep in his machine at all times. Again it's a matter of psychology. While some of the service items might very well be skipped from time to time without harm, once that procedure is started it is likely to snowball until major points are neglected. If every last detail is adhered to, nothing will be overlooked. And there is little difference in cost between a slipshod service job and a thorough one; certainly never enough to compensate for downtime and repairs caused by neglect.

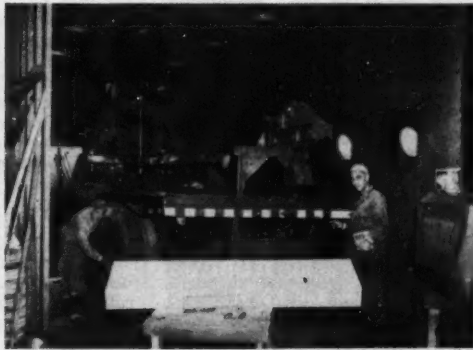
Another requirement, rigidly followed, is that the operator thoroughly check his crane and tackle before each job. The condition of such things as brakes, clutches, controls, cables and sheaves must



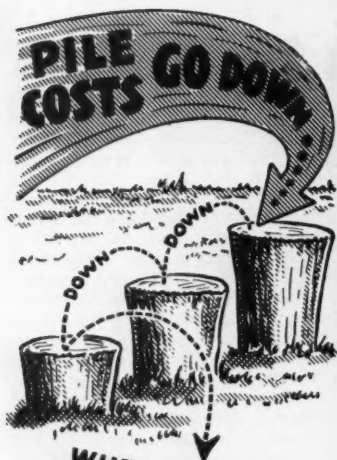
MAJOR OVERHAULS are handled in Gerosa's home yard in New York where this 25-ton Manitowoc Speedcrane is being rehabilitated. Here, its rebuilt gasoline engine is being hoisted aboard.



STEAM CLEANING with Kerrick machine is always first operation when machine is brought back for full check-up between jobs.



REPAINTING, an important overhaul step, is done in well-lighted booth fitted with exhaust fan. Spray-gun lines extend outside to yard, where larger equipment is painted after sandblasting.



**WHEN YOU USE  
SUPER-VULCAN  
OPEN TYPE  
DIFFERENTIAL-ACTING  
PILE HAMMERS  
18C, 30C, 50C and 80C**

• Stretch your pile-driving dollar! Put Super-Vulcan—mightiest of all pile hammers—on the job. Get twice the regular number of smashing blows per minute on 25 to 35 per cent less steam. Drive more piles per dollar, pocket substantial costs savings.

This powerful hammer combines simple design, compactness and long-time durability to give you greater operating economy. Piles go down faster, easier, and at less cost than you ever imagined. Remember, Super-Vulcan saves three important ways—on time, maintenance and motive power costs.

Get set with this dependable, money-saving pile driver. Write for full details today.



Sizes:  
18C-30C-50C-  
80C meet all  
needs.

**VULCAN IRON WORKS**  
Since 1892  
331 North Bell Avenue  
Chicago 12, Illinois

## CRANE MAINTENANCE ... Continued



OVERHAUL SHOPS handle major repairs to engines and accessory equipment. They are equipped with engine stands and monorail chain hoists to make service easy.

be noted and entered on a check-sheet posted in the machine. This is another reminder to the operator that he is responsible for an expensive piece of machinery, and that on its continued safe operation depend his livelihood and the lives of himself and the contractor's men.

The Gerosa firm knows that these simple rules pay off, for it is an old hand in the crane business. It was one of the pioneers (in the early 1920s) in the use of long-boom, jib-equipped cranes for erecting structural steel in tall buildings, and today it still confines itself to "tagline work." Its 28 machines range from a 7½-ton Lorain on rubber to a 70-ton Lima crawler. All but one are powered by gasoline engines, which Gerosa feels give smoother operation than diesels, with a resultant increase in safety and in tonnage of steel erected. It

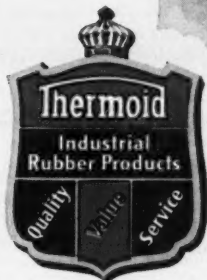
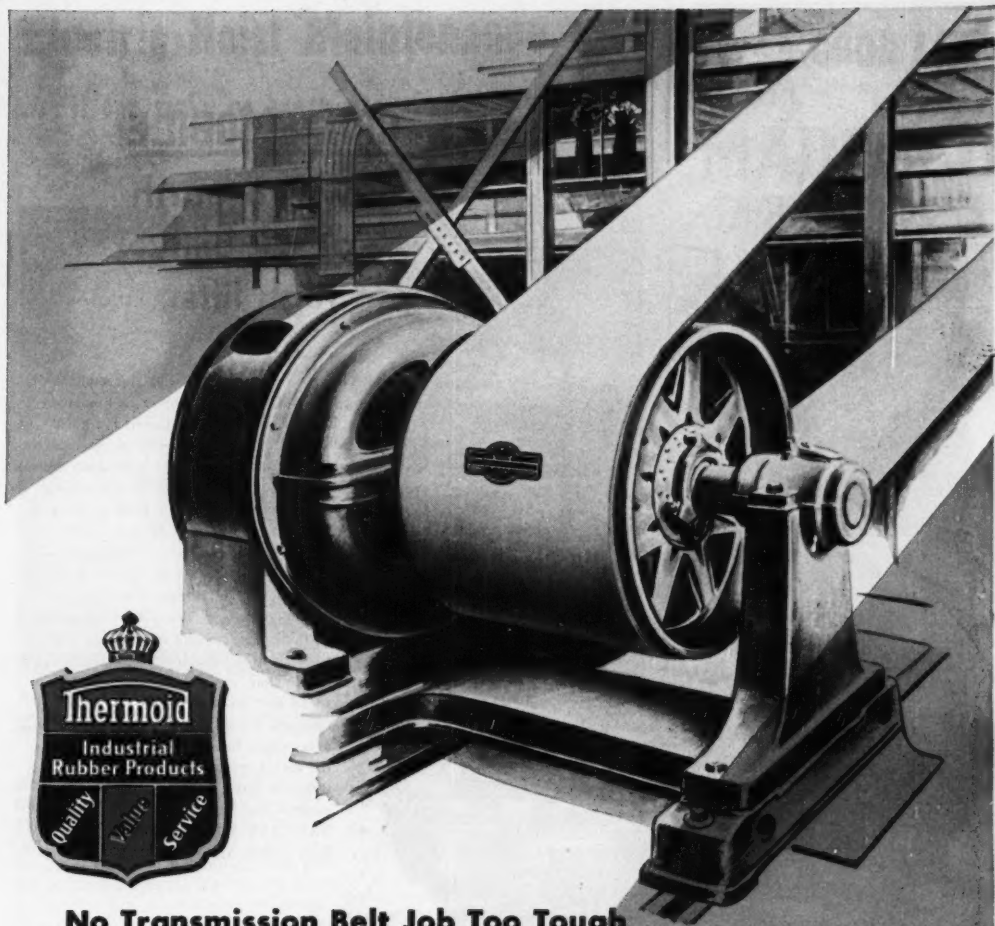
recommends diesels for shovel work, however, where added vibration and surges of power are an aid in loosening material at the dipper.

The company is headed by the three Gerosa brothers: Larry, president; Fred, secretary; and Frank, treasurer. Gerry Poper is manager of the crane department, assisted by Tony Pastore, and Al Joos is master mechanic.

### Hyster Maintenance Guide

AN OPERATOR'S MANUAL emphasizing the importance of equipment care and maintenance, illustrated with photos and drawings, covering the Hyster D7N towing winch for Caterpillar D7 tractor has just been issued by Hyster Company, 2902 N.E. Clackamas St., Portland 8, Ore. Ask for Form 1184.





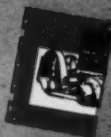
## No Transmission Belt Job Too Tough ... For Thermoid

Have you some really tough transmission jobs—regular belt killers? They won't be too tough for a Thermoid Transmission Belt. Let your Thermoid Distributor prove that by furnishing exactly the right belt for your job.

For general service he will offer "400", the all-purpose belt that will satisfactorily service all normal operating requirements.

For severe service, or for high speeds with small pulleys, he will recommend Thermoid High Speed "R", made with extra strong, hard 35-oz. duck and top grade rubber. Where there are oil or fumes injurious to rubber, he will recommend Thermoid High Speed "N", with Neoprene friction and skid. Each type is practically custom-built for the service for which it is recommended.

Here's The Book That  
Will Answer Many of  
Your Questions



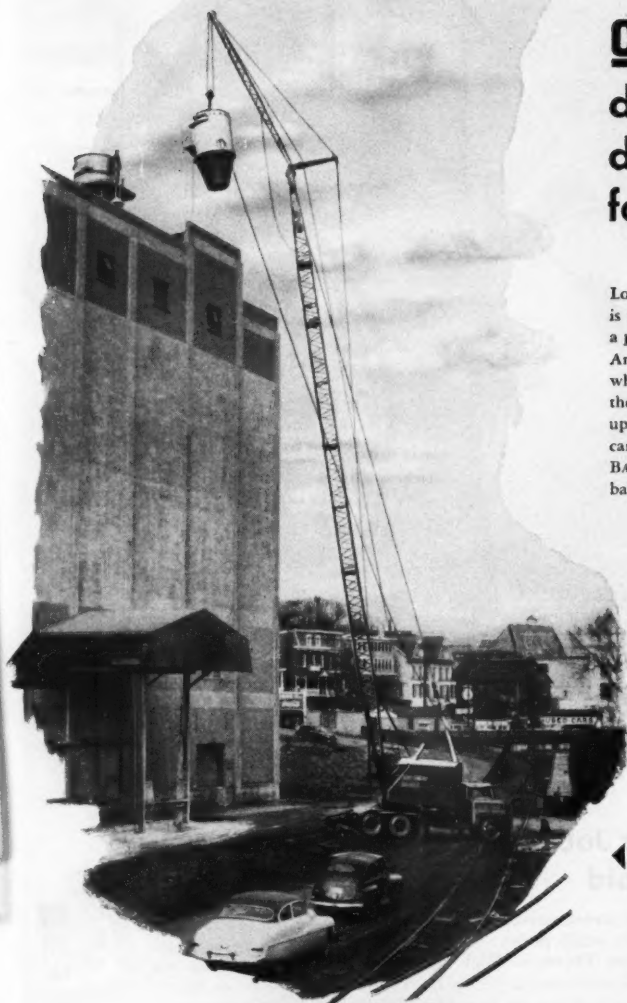
Ask for your free copy of  
Technical Bulletin No. 3678.  
It contains practical information,  
charts, tables and diagrams which will help you  
select the right transmission  
belt for your requirements.

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Conveyor & Elevator Belting • Transmission Belting  
F.H.P. & Multiple V-Belts • Wrapped & Molded Hoses

Rubber Sheet Packings • Molded Products  
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## **CRANEMOBILE**

**down-to-earth  
dependability  
for high lifts**

Look closely . . . you'll see that this contractor is using a BAY CITY CraneMobile to maneuver a pretty big tank right down onto its lag bolts! And that's typical of CraneMobile performance whether the job calls for delicate operations high in the air or the precision handling of heavy loads up to 25 tons near the ground. Both crane and carrier are engineered and built as a unit by BAY CITY to give you a perfectly integrated and balanced mechanism with a low center of gravity.

Because of the design, CraneMobile combines rugged, heavy duty construction with flexible, mobile service and good roadability. CraneMobile gives you more power than you'll need, desirable line speed and accurate boom and load controls. Let us show you why contractors everywhere have learned to depend on the BAY CITY built CraneMobile . . . write for latest catalog or see your nearest dealer.

**BAY CITY SHOVELS, INC.  
BAY CITY, MICHIGAN**

▶ This CraneMobile "180", owned by Forsyth's Transfer and Storage of Hagerstown, Md., is setting a grain processing tank atop the D. A. Stickell & Sons feed mill. The boom sections and 15-ft. jib used here were attached quickly and easily because BAY CITY boom sections are pin-connected and furnished with socketed pendant cables.

### **CHECK LIST**

- ✓ 20-25 Ton Capacity
- ✓ Pin-Connected Boom
- ✓ Hi-Collapsible Gantry
- ✓ Independent Power Boom Hoist
- ✓ Precision Power Load Lowering
- ✓ Removable Counterweight
- ✓ Specially Designed Carrier
- ✓ High Road Speeds



With a BAY CITY, the collapsible hi-gantry, floating bridle and six parts of line assure positive, safe boom control in every operating position. For additional safety, note the telescopic boom back-stops which are standard equipment. For all the best engineering features . . . look to BAY CITY.



# **BAY CITY**



186

**SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS**

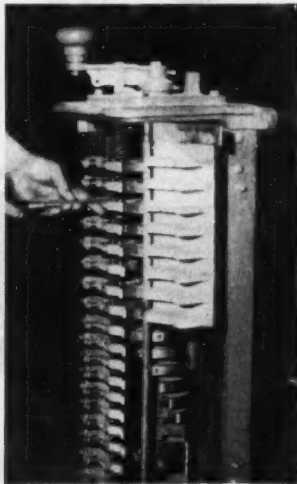
# Electric Hoist Maintenance

... It can make or break your building job

By FRED C. GROVER, Master Mechanic, B. Perini & Sons, Inc., Framingham, Mass.



**FINGERS** on electric hoist controller are key to safe, smooth operation. Check daily for proper tension, arcing and roughness.



**SHEAVES**, especially if inaccessible on cat-heads, can be fitted with relief plugs to prevent seal breaks and over-lubrication.

ASK ANY SUPERINTENDENT or master mechanic on a multi-story building job what his most important piece of equipment is. Chances are he'll point to his hoists, and at the same time cross his fingers for luck, for it's a well-known fact that the hoist is the heart of his job.

Proper preventive maintenance—a few minutes a day—is more than half the battle in keeping a hoist operating efficiently and continuously. Here's a quick run-down for an electric-powered rig.

## Motor

Check the oil level on bearings every day, either just before work or after the first few lifts. Keep the oil at proper level. Bearings themselves should be inspected every 20 or 30 days, depending on the volume and continuity of operation, and replaced if necessary. At the same time, contacts will bear watching because loose connections there mean faulty motor operation with fuse failures or jerky lifts. Collector rings should be cleaned occasionally, too, depending on the nature of the job. Keep all mounting bolts tight. Loosening leads to

misalignment with resulting strain and unbalanced wear.

## Controller

This is the heart of an electric hoist and means the difference between rough or smooth operation, dangerous or safe movement of materials and tiring or effortless operation on the part of a hoisting engineer.

Controller fingers bear watching every day for roughness and/or arcing. If two or more shifts are used, each operator should perform his own finger inspection as soon as possible after starting work, keeping them free from excess lubricants. Remove arc marks and roughness with fine sandpaper. If this fine abrasive won't remove it readily, don't take chances; replace the fingers and have an electrician determine the cause of arcing.

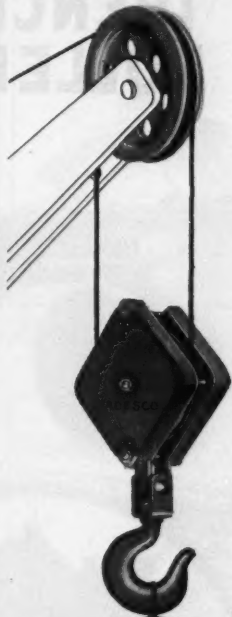
Spring tension is particularly important on contacts. Too little means excessive arcing; too much means hard operation. Cover fingers and contact shoes with a thin coating of vaseline, jelly or similar pure lubricant. In some instances, constant excessive arcing has re-

(Continued on page 110)

GET A GOOD LIFT

WITH

**MADESCO**  
**TACKLE BLOCKS**



A good lift is one that protects your wire rope investment. Check your equipment and replace with Madesco Blocks and Sheaves having Anti-Friction bearings or bronze bushings, to assure longer life for your wire rope. The Madesco complete line includes a block for every purpose.

Write for our complete catalog.

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**TACKLE BLOCK**  
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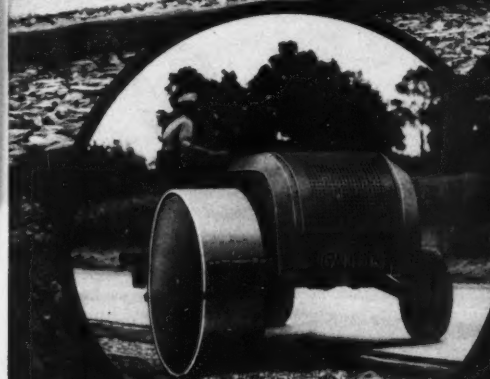
EASTON, PENNSYLVANIA

Over a quarter century of service

# **GALION**

## **TRENCH ROLLER**

# **SIMPLIFIES ROAD WIDENING JOBS**



### **GALION — THE ORIGINAL**

Galion originated the trench-type roller - - and is now the first to offer a completely new and improved design.

#### **FEATURES**

- Hydraulically controlled dual steering wheels.
- Adjusting and steering wheels travel on pavement.
- Works 25' below to 6' above road surface - - adjustment hydraulically controlled.
- Large diameter, variable weight compression roll.
- Rugged, constant-mesh transmission and spur gear final drive.
- Powerful engine completely enclosed under housing.

**ESTABLISHED 1907**

## **MOTOR GRADERS • ROLLERS**

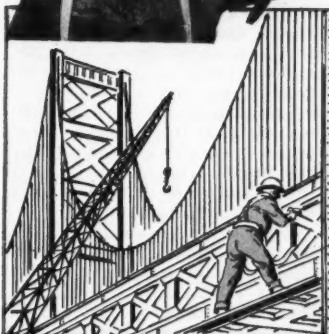
**THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.**  
Cable address: **GALIONIRON, Galion, Ohio**





# "Here's Two Reasons Why I'm Still Alive and Kicking"

Says Frank Kramer, Bridgeman, U.S. Steel's American Bridge Company



I was working on a bridge job in Ohio, when this happened. Except for two reasons, that would have been my last job.



A drift pin dropped from 60 feet above picked my head for a target. It was coming like a bullet. Somebody yelled, but there was no time to duck.



That pin struck my Skullgard. It would have bashed my skull . . . but Skullgards are tougher. The pin bounced off.



Bad luck wasn't through with me . . . that pin struck an I-beam, bounced back, and hit me full in the face. It felt something like getting kicked by a horse.



It knocked me right off the bridge beam. The undertaker was reaching for me again, but I fooled him a second time. Had my safety belt on.



The boys grabbed the safety line and hauled me up. I had a bloody nose . . . that's all. Skullgards and Safety Belts have got my vote for man's best friend ever since.

This true story—from the many in the files of American Bridge—explains why the company invests thousands of dollars annually in safety hats and belts alone. The equipment is bought for *protection*—but it pays extra dividends in production, through the added confidence that it gives to every worker.

American Bridge management says, "We are sold on safety hats . . . and so are our workmen. There is no law that compels them to wear Skullgards, but most men

would no more think of going on the job without helmets than of working in their bare feet. Once a man has seen how a helmet can save a life or prevent serious injury, he doesn't need urging to wear one."

M.S.A. Skullgards are safety-engineered for maximum protection . . . carefully designed for maximum wearing comfort. Choice of several types of linings, that can be easily removed, replaced, and adjusted for any head size. For complete details, ask for Bulletin DK-15.

## MINE SAFETY APPLIANCES CO.

BRADDOCK, THOMAS and MEADE STS., PITTSBURGH 8, PA.

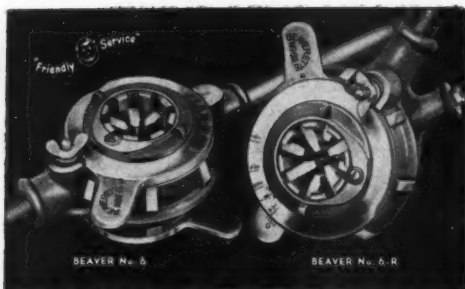
At Your Service

54 BRANCH OFFICES IN THE UNITED STATES AND CANADA



Call the M.S.A. man on your every safety problem . . . his job is to help you.





## MEET THE BEAVERETTES!!!

● If you have not yet met the Beaverettes, it's high time you were introduced, for these handy little self-contained threaders have been favorites for many years.

The Beaverettes are unique — there is nothing similar to them on the market.

Covering a useful range of pipe sizes from 1/4 to 3/4 inches, the Beaverettes are fully adjustable for cutting standard, oversize or undersize threads of uniform length.

Complete units, having no loose parts of any kind, these tools are accurately centered on the pipe by a smooth-working universal chuck.

Beaver No. 6 is a two-handle non-ratchet tool; the No. 6-R, a standard one-handle ratchet tool, suitable for either bench or confined-area use. Both models are available in either American or British standards, right or left hand, for threading 1/4, 3/8, 1/2 and 3/4 inch pipe. Extra changeable dies are available for 1/8 inch size.

Write Beaver Pipe Tools Inc., 228-300 Dana Ave., Warren, Ohio, for new "Operating Guide" to help you secure the best possible results from your Portable Pipe & Bolt Machines and Hand Pipe Tools.

# BEAVER

## PIPE TOOLS



OUR SEVENTY-FIFTH YEAR

## 75 Years Young

As we enter our 75th year of manufacture, we are grateful to the many customers and devoted distributors, who have learned that the name JACKMANCO stands for quality of manufacture and superior performance on the job.

WHEELBARROWS  
DRAG SCRAPERS  
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CONCRETE CARTS  
LAWN ROLLERS  
SALAMANDERS

# JACKSON MANUFACTURING CO.

HARRISBURG • PENNSYLVANIA

(Continued from page 107)

sulted in an insulative effect, especially on first and second fingers. The operator then gets no easy low-power start as he turns the controller. Then, striking the third or fourth notch, he gets too much of a surge at once, with a possibility of broken sheaves, cable breaks or drum injuries.

When a daily check is made on fingers, also include the controller shaft and contact shoes. If the latter are rough or sharp, smooth them down with fine sandpaper or a fine file, particularly on the leading edges. If they become deeply pitted, replace them. You can buy and install a lot of fingers for a small fraction of the cost of even a minor hoist breakdown.

Every week, top and lower shaft bearings should be lubricated, along with the positioning ratchet on the roller. Spring tension on this roller should be just enough to hold it in proper position. The magnetic switch can be a tricky little gadget. It must be checked and connections tightened periodically. To allow pitted or bent contact points in a magnetic switch is a cardinal sin in the hoisting game. You may have heard occasionally how a cage or hopper continued to climb after the controller had been returned to off-position. This overriding results when contact points are pitted, bent or damaged, delaying a shutoff of power which may damage the hoist if the operator isn't alert and quick enough to disengage his friction or apply the brakes.

### Hoisting engine

Drum shafts require daily greasing, and all linkage should be checked as often as needed, depending on frequency of hoisting. Open gears are particularly subject to a great deal of wear if not sufficiently lubricated. Emergency load-holding brakes should also be on the list for a daily check. Main brake bands should never be allowed to wear in as far as rivet heads, but should be relined in time to prevent scoring of drums. Wear of friction should be compensated by adjusting throw lever for maximum leverage. Friction return springs should have enough tension to release them from their drums, but not so tight that extra effort is needed by the operator to overcome it each time the cones are engaged to make a lift.

### Running gear

At the start of each shift, an operator should run up his hop-

per, cage or hook to the top stop-mark, watching to see that the cable lays and wraps correctly. Each line should then be payed off slowly and inspected for fractures, breaks or uneven wear. Next come sheave lips and sockets. One misfit sheave or one lip break can cut the life of a cable 30%. Another thing: Just because cathead sheaves are aloft and not readily accessible, don't neglect them when greasing fairleads and other sheaves. They're too important.

Check and lubricate, if necessary, all safety stops on cages or hoppers. Riding shoes should have proper clearance. Check pipe or timber runs weekly for tightness and plumb. If a countersunk bolt loosens up, an ascending or descending cage will shear off its head—if you're lucky. More likely, it will split an oak run, injure a guide shoe or spring, or bind a safety dog.

When a hoist breaks down—even for such a minor cause as a shorn bolt head, unadjusted contact shoes, or lack of lubrication, it can very often interrupt a concrete pour, cleanup schedule, or deliveries to a dozen trades. A little caution and a regular daily and weekly hoist maintenance program can keep the hoist — and the job — going on schedule.

### *Maintenance Tips...*



IN RECLAIMING 136 acres from the ocean at Long Beach, Calif., by dredging, Pacific Dredging Co. finds combination of sand and salt water pumped through 30-in. pipe at high pressure cuts through the pipe at annoyingly frequent intervals. When a failure occurs, sound section of pipe is cut into dredge line and damaged length is floated ashore. Here a patch is made by arc-welding with Lincoln machines. Patch material is flame-cut from discarded pipe.—From Lincoln Electric Co., Cleveland, Ohio



# All the tool you need

## ...to remove scale, paint, rust!

**STANLEY No. 311  
SCALING HAMMER KIT**

Many times faster than hand scaling — more convenient than air hammers — the Stanley No. 311 Scaling Hammer is completely self-contained. It needs no hose, no pump, no converter, no junction box. It's handy and light — quick to set up. Just plug into a nearby lighting circuit.

Operators use the No. 311 for hours without tiring. "Free-thrown" plunger (exclusive with Stanley) has no direct connection with motor mechanism. It hammers without the need for pressure on the handle. **Result:** there's no kickback, less vibration, and virtually no chance of breakdown.

The No. 311 weighs only 13 lbs. Packs in handy steel carrying case. Operates on either A.C. or D.C. Powerful motor and heavy duty seal type ball bearings assure long life. Wide variety of scaling tools available. See the No. 311 at your tool dealer's, or write for descriptive folder. Stanley Electric Tools, 437 Myrtle St., New Britain, Conn.

# STANLEY

Reg. U. S. Pat. Off.

**HARDWARE • TOOLS  
ELECTRIC TOOLS  
STEEL STRAPPING • STEEL**

# KNOW YOUR OIL...

## If You Want Good Equipment Performance

By RALPH ANDERSON, Service Representative, D-A Lubricant Co. Inc., Indianapolis

SINCE THE END of World War II, many heavy-duty equipment operators have experienced very poor engine performance resulting from sludged engines, stuck or broken rings, excessive cylinder or liner wear, loss of power and high oil consumption. This trouble has developed at a higher rate than one can pass off as accidental or incidental. It is no small matter to overhaul a power unit, dozer or shovel engine, as the cost can easily reach four figures, in addition to a substantial loss from down-time.

When trouble develops, it is customary for the operator to blame the engine manufacturer, the fuel, or the oil supplier. Not once would the thought occur that he might be at fault because he used the wrong type of oil. Yet most of these engine failures could have been prevented had he been informed suf-

ficiently to match the type of oil required for his engine, fuel and operation. The problem the operator or engine owner faces, in obtaining the proper oil, has been rather complicated from a supply and informational standpoint. The purpose of this article is to enable them to have a better understanding of this problem.

How did these circumstances come about? They were a result of changes that have occurred in engine design, character of the fuel, nature of operating conditions and the lack of information on the development of new lubricants. Diesel engine manufacturers have been increasing the output of their engines, with an eye on engine weight-reduction. Higher rpm's with greater temperatures, adding superchargers, increasing amounts of fuel injected, etc., have put

more strain on the oil to keep the engine clean.

The increased use of high sulfur fuels in diesel engines has caused excessive wear in liners and rings, plus a serious deposit problem. Sulfur in fuel forms sulfuric acid during the combustion process, which eats metal like a rat eats corn from a crib—a nibble at a time. Sulfur in fuel is also similar to the ashes in coal—the more you have, the more difficult it is to have clean combustion. We all realize what poor combustion does to contaminate the oil with more fuel residues.

The increased loading of many engines has been more severe than most of us realize. Bigger loads to carry, better design of dozer blades and power units pushed to the limit have caused some units to operate

(Continued on page 115)

## Parmanco

HI-SPEED HORIZONTAL  
D R I L L S

New Traction Drive with Forward and Reverse



**THIS UNIT IS  
DELIVERING  
6-inch shot-holes  
READY FOR LOADING**

**at better than  
TWO FEET A MINUTE!!**

The new Parmanco Hi-Speed Horizontal Drill is completely redesigned around a 40 h. p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time — a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition, the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

• For both Mines and Construction

**PARIS MANUFACTURING COMPANY • PARIS, ILLINOIS**



how **THIN** is a

**SHADOW?**



Can you picture a millionth of an inch? About the thickness of a shadow would come close to describing it. Yet—parts for American Bosch diesel fuel injection equipment are produced to accuracy tolerances of millionths of an inch every day on a *production basis*.

Such precision manufacture explains the dependability of diesel fuel injection equipment supplied by American Bosch.

Combined with constant development and field engineering and extensive service facilities, it helps explain, too, why American Bosch-equipped diesel engines continue to set new standards of efficiency and economy in ever-widening fields of application.

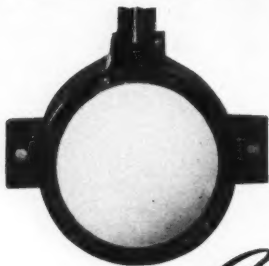
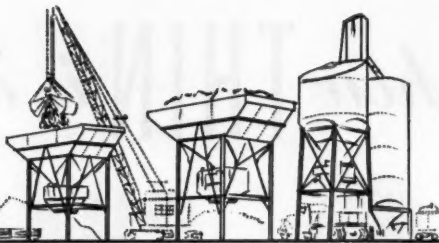


**American Bosch**

MAGNETOS • GENERATORS • VOLTAGE REGULATORS • IGNITION COILS  
ELECTRIC WINDSHIELD WIPERS • DIESEL FUEL INJECTION EQUIPMENT

AMERICAN BOSCH CORPORATION • SPRINGFIELD 7, MASS.

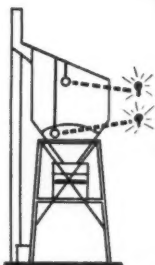
## TO POCKET AN EXTRA PROFIT —



## EQUIP YOUR PLANT FOR TOP PRODUCTION!

LITTLE THINGS can count up big in the profit column. Little things that keep your batchers running smoothly hour after hour — day after day; little things that save in costly, critical manpower.

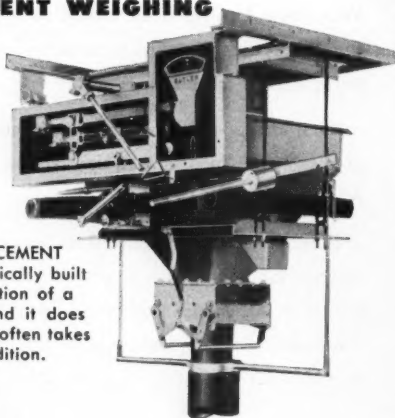
*As examples:*



**BUTLER Positive BIN LEVEL INDICATORS.** They'll fit any make of plant; work with virtually any material. Sealed against moisture or dust. Practically indestructible yet sensitive as a violin. And absolutely POSITIVE in action.

### BUTLER CEMENT WEIGHING BATCHERS

We hope you haven't—but if you have a bulk cement bin made by some one other than BUTLER you can still get the advantage of quick accurate batching by installing a BUTLER CEMENT BATCHER. It's specifically built to match the production of a dual drum paver and it does it so superbly that it often takes care of a 27E in addition.



Any of these you want more information on? Just a postcard will get our prompt attention.

Want to look over the best in Bulk Cement Plants? Ask for Bulletin 210. It's FREE!



### BUTLER AIR JETS

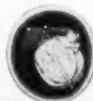
Instant-acting, trouble-free, positive and durable. Worth their weight in diamonds when cement gets obstinate. Install them and activate them with the —

### BUTLER CEMENT AERATOR

Nothing else like it. So compact it takes only the space of a standing man. Yet, everything's there — compressor, tank, motor and all controls — all in one neat package. There's a dual pressure take-off so you can use air for other applications. Flat tires, for instance.

### BUTLER ELECTRIC VIBRATOR

A highly practical traffic-cop to keep cement from loading in the batcher. And as a signal to your truck driver that the batch is complete it sends him off to a quick start, too.



# BUTLER BIN CO.

949 BLACKSTONE AVE., WAUKESHA, WIS.

## REFERENCE CHART

TYPE OF OIL	GENERAL USAGE
<b>Regular</b>	Passenger cars, moderate conditions.
<b>Premium</b>	Passenger cars, operated at higher speeds than moderate.
<b>Heavy-Duty 2-104B (MIL-2104)</b>	Gasoline and diesel engines in trucks, tractors and power units, in normal heavy-duty service, with fuels containing less than 0.35% sulfur. Passenger cars with hydraulic valve lifters.
<b>Heavy-Duty 2-104B, S-1</b>	Gasoline and diesel engines in trucks, tractors and power units, in severe heavy-duty service or with high sulfur fuels in which sulfur content is less than 1.0%. Passenger cars with hydraulic valve lifters, driven at high speeds.
<b>Heavy-Duty 2-104B, S-2</b>	Diesel engines in tractors and power units that are severely loaded or with fuels containing up to 3.0% sulfur. Required for certain makes of supercharged and high-output diesels.

at near-maximum horsepower, due to the increased load factor. The diesel engine tends to drop in efficiency beyond the 75% maximum hp rating. Although increasing amounts of fuel are injected, the air volume in a diesel remains constant, and complete combustion is less probable with the resultant increased formation of fuel residues. To keep pace with these changes, the oil industry has developed improved lubricants to counteract the above factors for better engine performance and much longer engine life.

What are these new lubricants? During the last three years, they have been referred to as lubricants meeting U. S. Army Specification 2-104B, Supplement I (commonly referred to as Series 1), and 2-104B, Supplement II (also referred to as Caterpillar Superior Lubricant, Series 2). Properly made, S-1 and S-2 oils have three distinct advantages over former heavy-duty oils:

(1) Improved detergent and oxidation-resistant additives in higher concentration to give far greater protection in keeping engines clean from sludge deposits of fuel residues, caused by use of high sulfur fuel and increased-load factors.

(2) Alkalinity of oil neutralizes sulfuric and carbonic acids in liner and ring band areas, which prevents corrosive acid wear. If fuel contains more than 0.35% sulfur, an alkaline oil is necessary to pre-

vent excessive engine wear. Previous oils were refined and manufactured to be exactly neutral and in service, would turn acid. Sufficient alkalinity is present in new oils to remain acid-free during normal change periods, which has the added advantage of eliminating any chance for oil corrosion of bearings.

(3) Preservative qualities are present that prevent rust and moisture corrosion on engine parts during period of idleness and storage.

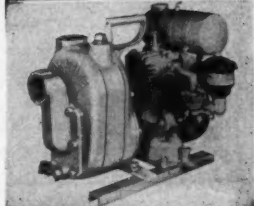
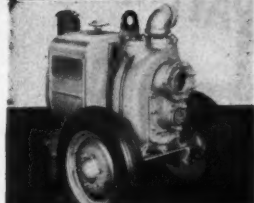
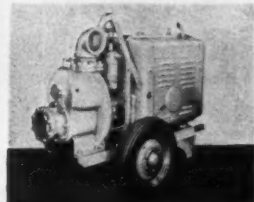
Examples like the following can be repeated many, many times. Last Spring, an operator purchased a brand-new crawler tractor. A heavy-duty 2-104B oil, that previously had given satisfactory service, was used and proper drain periods were maintained. However, the sulfur content in the fuel had risen to 0.6%. After 1,100 hr of service, the engine would barely move under its own power. The symptoms were high oil consumption, heavy exhaust smoke, excessive blow-by and lack of power. Examination revealed stuck rings, high liner and ring wear, and sludge deposits covered all internal engine parts. Could this have been prevented? Of course, if the operator had taken the precaution to do only one of two things: (1) Used a better quality S-1 or S-2 lubricating oil or (2) obtained a fuel with a sulfur content less than 0.35%. Either method would have

(Continued on page 118)

# PUMP DESIGN *At it's Best*

## CMC DUAL PRIME

THE LAST WORD IN  
PUMP DEPENDABILITY



• Unmatched self-priming speed is assured by exclusive twin jet construction.

• Extra air-handling ability gives dependable performance when ordinary centrifugal pumps become air bound and lose prime.

• Non-clogging, open thrash type impeller handles solids up to 1/4" intake size.

• CMC DUAL-PRIME pumps give top performance and maximum dependability even under the most adverse conditions.

Write today for latest illustrated catalog. CMC DUAL-PRIME pumps are available in sizes from 1 1/2" to 10"—capacities from 3000 to 200,000 gallons per hour.

CONSTRUCTION  
MACHINERY  
COMPANIES



WATERLOO, IOWA



4-wheel drive 1½-yd. Model HM PAYLOADER on New Jersey Turnpike, George M. Brewster & Son, Inc., contractor.

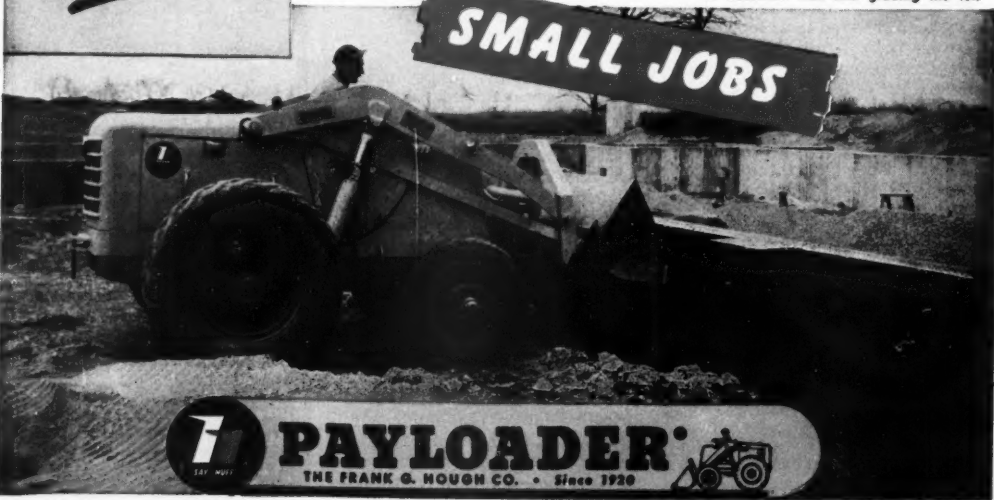
**PAYLOADERS**  
Pay Off  
on  
Any Job

Big or small — tough or easy — any job is a Payloader job . . . because only a PAYLOADER is completely designed for its purpose.

Only the PAYLOADER gives you the high multiple forward and reverse speeds . . . the engine over wheels for maximum traction . . . the powerful shovel crowding action . . . the simplicity of design for maintenance economy . . . the tip-back bucket to assure full loads . . . the dependability of large heavy duty clutches . . . the rugged overall construction and complete operator comfort and visibility which means more working hours per shift.

That's why many of America's progressive contractors, large and small, own fleets of PAYLOADERS; why Public Bodies rely on PAYLOADERS; why you too should investigate these high speed, rugged tractor-shovels. There's a size of PAYLOADER to fit your job; 12 cu. ft.; ½-yd.; ¾-yd.; 1¼-yd.; 1½-yd. See your Hough Distributor or write The Frank G. Hough Co., 706 Sunnyside Avenue, Libertyville, Illinois.

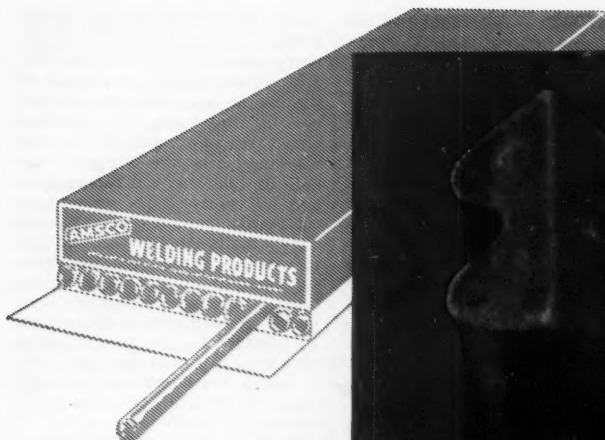
½-yd. Model HE PAYLOADER backfilling a basement wall and grading the lot.



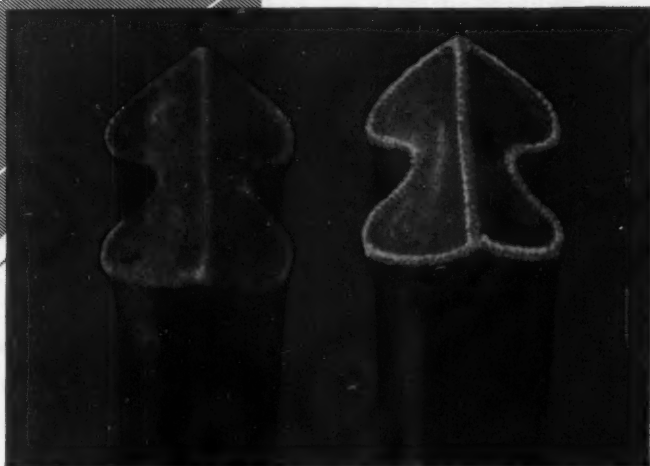
**PAYLOADER**  
THE FRANK G. HOUGH CO. • Since 1920







How AMSCOATING with Amsco  
Hardfacing Rods saves you materials  
... manpower ... money.



## Why will ONE of these bits LAST TWICE AS LONG?

### AMSCOATING...stands for control of wear by Hardfacing...

Hardfacing rods—and recommendations for their use—are as sound as the manufacturer who makes them. AMSCO has been fighting wear for a half-century—first with Manganese Steel, and later with AMSCO Hardfacing Products.

If you have a problem of wear caused by impact, abrasion, heat or corrosion...

Find out how AMSCOATING can save you materials ... manpower ... money!

These bits are used by a Southern quarry for drilling blast holes. A combination of limestone and flint causes extreme abrasion—and a real problem of wear. In an attempt to cut replacement costs, labor and down-time, several makes of hardfacing rods were tried, but without much success.

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Result? AMSCOATING did a job that had never been done before. The drill bits held their edges longer ... averaged 60 hours of drilling—between regrinds—instead of 30. Maintenance costs and bit changes were cut in half!

AMSCOATING saves you money in terms of lower maintenance costs, less down-time ... more production. The actual on-the-job example cited above is one of the many applications that prove it! Write today for illustrated catalog describing dollar-saving AMSCO rods ... and the name of your nearest AMSCO distributor.



# AMSCOATING

THE RIGHT WAY TO SAY HARDFACING

**Brake Shoe**

## AMERICAN MANGANESE STEEL DIVISION

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Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.  
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

(Continued from page 115)

been effective in preventing this engine failure. The engine manufacturer had published these instructions, which, if followed, would have prevented this failure.

Within the last year, a super-charged diesel was purchased by a firm that insisted on using the oil that had always given them excellent performance in other types of engines. The engine manufacturer cautioned against the use of this particular type of oil, and if the warning were ignored, predicted when overhaul would be necessary.

Hell or high water could not get the proper type of oil in this engine. The prediction was 200 hr wrong, but the projected trouble was 100% accurate. Once an engine is paid for, you can ignore recommendations and use goose grease, if you are so inclined, but be prepared for the added expense.

An operator had the problem of deciding the type of operation to which his diesel was being subjected. For ordinary service conditions, a 2-104B-type oil was specified by the engine manufacturer, and for heavy-duty service

conditions, a 2-104B, Supplement I, was recommended. The operation was bulldozing rocky overburden, where maximum loading of the engine was required a major part of the time. The problem ended when he found that the S-1 oil would cost him 10c more per gal. In 1,600 hr, the compression and oil control rings were stuck tight with carbon sludge. Little did he realize that his oil, the cost of which is of minor consequence compared to his total operating expense, is the most important factor in the performance of his engine. In 1,600 hr, he had used 80 gal of oil. If he had used the right type, it would have cost him an additional \$8. By using the wrong type, it cost him \$800.

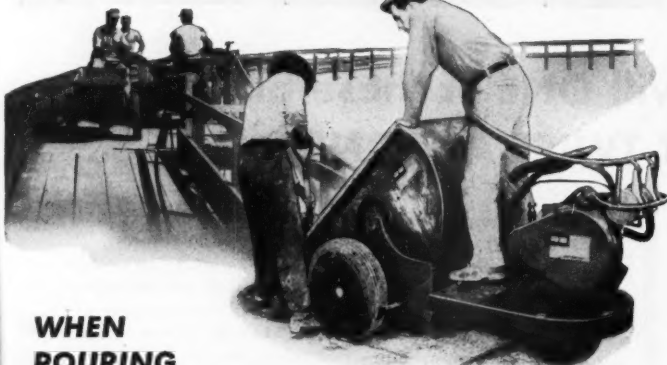
Today, engine oils being manufactured in this country, are generally divided into five classifications. These types are identified by meeting only certain minimum engine-test requirements. Due to the wide variation in the classifications, oils of the same type can vary considerably in quality. The minimum standards classifying each type and their general usage, based on engine manufacturers' recommendations and general field experience, are as follows:

(1) **Regular**—A straight mineral oil, containing no oil additives. Recommended for use in internal combustion engines, under moderate operating conditions. Example: a passenger car, traveling at moderate speeds.

(2) **Premium**—An additive-type oil having sufficient resistance to oxidation and bearing corrosion properties to pass the L-4 (Coordinating Research Council designation L-4-545) engine test. Recommended for internal combustion engines when operating conditions are considered more severe than moderate. Example: passenger cars operated at higher speeds than moderate.

(3) **Heavy-Duty (2-104B)**—An additive-type oil having sufficient resistance to oxidation, bearing corrosion, ring sticking and deposits to meet engine tests prescribed in U. S. Army Specifications 2-104B. This specification has recently been superseded and improved by MIL-O-2104 Specification. Recommended for internal combustion engines in normal heavy-duty service and cases in which sulfur content of fuel does not exceed approximately .35%. Example: gasoline and high-speed diesel en-

## RUNWAYS BECOME *SPEEDWAYS*



**WHEN  
POURING  
CONCRETE WITH**

**GAR-BRO *Power-carts***

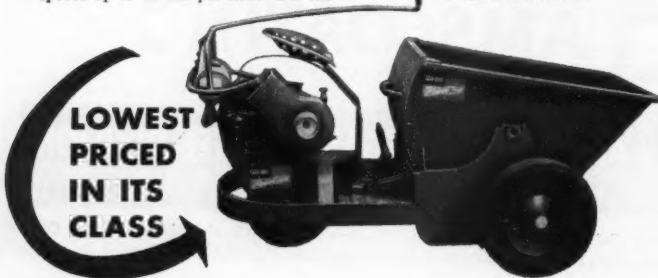
**...HANDLE MORE THAN 3 PUSH CARTS!  
...TRAVEL 2 TO 3 TIMES AS FAST!**

**ONE MAN WITH** a Power-cart can do as much work per day as 6 to 10 men with wheelbarrows. Up-hill, down-hill, over runways or rough ground, the Power-cart moves a 14 cu. ft. load at speeds up to 12 mi. per hour. Get the

facts on its low price, low operating cost and low maintenance cost; write for Bulletin No. 83.

**GAR-BRO MANUFACTURING COMPANY**

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LOS ANGELES 21



**LOWEST  
PRICED  
IN ITS  
CLASS**

gines in trucks, tractors and power units in normal heavy-duty service, under moderate conditions.

**(4) Heavy-Duty S-1**—An alkaline additive-type oil having sufficient resistance to oxidation, bearing corrosion, ring sticking, wear and deposits to meet engine tests prescribed in U. S. Army Specification 2-104B, Supplement I. Recommended for internal combustion engines in severe heavy-duty service or with high sulfur fuels, in which sulfur content is less than 1.0%. Example: gasoline and high-speed diesel engines in trucks, tractors and power units in heavy-duty service, under more severe conditions than normal.

**(5) Heavy-Duty S-2**—An alkaline additive-type oil having sufficient resistance to oxidation, bearing corrosion, ring sticking, wear and deposits to meet engine tests prescribed in U. S. Army Specification 2-104B, Supplement II. Recommended for high-speed diesel engines in severe heavy-duty service or with fuels containing up to 3.0% sulfur. Required for certain makes of supercharged and high-output diesel engines. Examples: high-speed diesels in tractors or power units severely loaded.

The point to keep in mind, when selecting an oil for your engines, is to use an oil of sufficient quality to at least equal the requirements of your engine, fuel and operation. Do not attempt to lubricate the operational conditions of No. 4, with an oil in the No. 2 classification. On the other hand, using a No. 4 oil to lubricate the operational conditions listed in No. 2 will give a vast margin of protection, which can be utilized by increasing the drain schedule.

For each type of oil, there is a pattern of additive concentration that may be of interest. The following are set forth only as approximate values: No. 1—0.0%; No. 2—0.5 to 2.0%; No. 3—2.5 to 4.5%; No. 4—5.0 to 10.0%; No. 5—16.0 to 20.0%.

The oil industry has taken a major step in providing better engine lubricants for the trucking, contracting and all heavy-duty equipment operators. To ignore their benefits can be costly. More concentration on oil information and less on cents-per-gallon can really pay dividends. Follow engine manufacturers' recommendations and buy a quality lubricant from a reputable manufacturer. Save yourself trouble and money. Know your oil.

## IDLE EQUIPMENT COSTS YOU MONEY



## BUY DEPENDABILITY



successful  
contractors use  
**LONG-LIFE**  
VIBER VIBRATORS

### THE DIFFERENCE BETWEEN PROFIT and LOSS

The constant fight to maintain production schedules is a headache to every contractor. Breakdowns at a crucial point can mean the difference between making or losing money. **SUCCESSFUL CONTRACTORS HAVE FOUND DEPENDABLE EQUIPMENT CAN MAKE THE DIFFERENCE.**

Dependable equipment offers the maximum in working hours with the minimum of trouble. Viber's careful selection of the finest materials and years of experience in producing **only concrete vibration equipment** has proved **DEPENDABILITY**.

### VIBER VERSATILITY

Viber engineers have designed a complete line of concrete vibrators that can be interchanged on the job. This helps eliminate costly delays and keeps production working smoothly. It also makes equipment last longer because only worn out parts have to be replaced . . . not entire units.

Consider Operating Efficiency . . . Reputation  
... Price and **BUY VIBER VIBRATORS**

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CONCRETE VIBRATORS SINCE 1931

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Sagtikos State Parkway,  
Suffolk County, N. Y.

# Again Heiliners

## move more dirt faster..at less cost

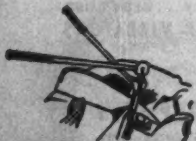
Heiliners are built  
to help you meet  
schedules, save money!



**200-HP Cummins Diesel**  
— High top speed (25  
m. h.), plenty of digging  
power. Compression release  
for quick starts.



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trol unit has easy-to-reach  
controls. Levers adjustable to  
suit operator.



**Good Visibility** — No ob-  
structions block operator's  
vision ahead or behind. He  
can always see how he's  
doing.



**Comfortable Seat** — Re-  
duces operator fatigue, by  
absorbing the shocks in  
rough going.



**4-wheel Brakes** — Heavy-  
duty two-shoe air brakes.  
Auxiliary hand controls pro-  
vided also.



**Final Planetary Drive  
Reduction Gears** — Can  
be serviced without remov-  
ing wheel or disturbing  
brakes or hub bearings.



**FAST — in the Cut!**  
**— on the Haul!**  
**— and on the Fill!**



**"They do the job quickly and without difficulty, regardless of the type of materials encountered."**

— Writes Milton A. Hendrickson,  
 Vice President Hendrickson Bros.,  
 Inc. Valley Stream, N. Y.

On the 1,000,000 cu. yd. Northern-Sagtikos State Parkway job in Suffolk County, N. Y., three Heiliners prove that they pay out in all kinds of ground and fill conditions. Soil is loam, clay, and sand. Hauls range from 1,200 to 5,500 feet.

It's the same story on jobs of all kinds across the country — no matter how tough the going, you can count on Heiliners for outstanding performance. Their extra traction, extra speed, and bonus loads make money for you every time.

Heiliners are available with either an 18-cu. yd. scraper or a 20-cu. yd. bottom-dump wagon — both interchangeable.

Take a good look at a Heiliner. Watch it operate. See for yourself how it moves lots of dirt in a hurry. Ask your Heil road-machinery distributor to arrange a demonstration.

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**easier . . . faster . . . at less cost**



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**"grease on the go"**  
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**ALEMITE**  
**portable service**  
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**You Save Time** by bringing complete power lubrication to trucks, tractors, equipment right on the job! Air-operated pumps deliver grease "refinery clean" direct-from-barrel-to-bearing.

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**To suit your needs exactly . . .**

**Alemite Portable Service Stations are S-E-C-T-I-O-N-A-L-I-Z-E-D**

Yes, whatever selection of chassis or gear oil pumps and reels you require for 100 lb. drums, you can easily combine them into a tailor-made Alemite Portable Service Station—*exactly keyed to your needs!*

Other Alemite heavy duty pumps, reels and accessories are also available

for 400 lb. and 54 gal. capacity drums.

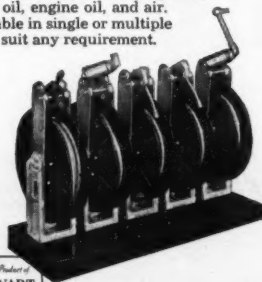
Send today for **FREE** illustrated catalog describing this equipment. Write to Alemite, Dept. F-71, 1850 Diversey Parkway, Chicago 14, Illinois.

**ALEMITE**



**Alemite Pumps.** Air-operated for delivering engine oil, chassis grease, and gear oil from original drums. Available for individual or "group" installation.

**Alemite Hose Reels.** For high and low-pressure delivery of chassis grease, gear oil, engine oil, and air. Available in single or multiple units to suit any requirement.



# THE *Maintenance Shop...*

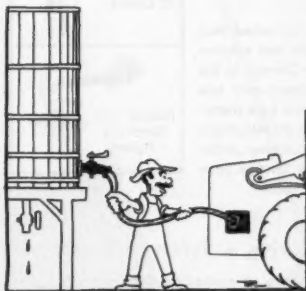
A MONTHLY EQUIPMENT SERVICE AND REPAIR FEATURE

## Dirt: Engine Enemy No.1

BY HOMER C. CAMPBELL, Service Manager  
H. W. Moore Equipment Co., Denver, Colo.

THE INTRODUCTION of the internal combustion engine probably had more to do with the social and economic welfare of this nation than any one other single development. It put us on wheels and permitted us to go places and do things. It let us increase our productive ability to a point reached by no other nation, and permitted us to develop a social relationship with our fellow men that makes us the world's most democratic nation.

By the same token, we have become so dependent upon that same internal combustion engine that in times of stress, such as we are in now, the loss of the use of that engine materially affects the lives of us all. At this time, we are overloaded with civilian projects, as well as the job of building to defend the very things that these inven-



what we have. With that thought in mind, we present further ideas that might be useful in getting more work from your present machines.

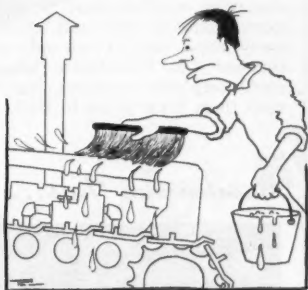
The old adage says that Cleanliness is next to Godliness—but for engines themselves, Cleanliness should head the list. Dirt plays the devil with fine working parts, and these are becoming scarcer daily. Could it be that we are not practicing proper preventive maintenance, that we are not keeping the engines clean; and that these force us to waste too many replacement parts?

Simply stated, internal combustion engines must have air, fuel, lubrication and a method of dissipating excess heat. The air entering the combustion chamber must be clean, since it comes in contact with vital working parts such as pistons, cylinder walls and rings. It must not be contaminated with dirt and dust, which are abrasives that cut and tear at the working metal parts until severe damage is done and efficiency is lost. The care of air cleaners or filters was discussed in detail in our May issue.

With reference to fuel and lube oils, we can assume that products meeting the specifications ordered are being delivered, and that they are clean and free from foreign material such as dust and dirt. However, it is a well-known fact that we are putting just about as

much dirt into our engines through the fuel, as we permit to get in from other sources. Too much emphasis cannot be put on the necessity of clean fuels in modern diesel engines. Inadequate storage facilities can contaminate good clean fuel. So can the procedures used in handling it from storage to the operating units. The use of cans and funnels and other containers should be discouraged. Wherever possible, fuel should be transferred from the storage container directly to the operating unit by a suitable pump. Storage containers must be so set up that the sediment and water can settle to a low point in the tank and in such a place that they cannot be picked up by the transfer pump. Containers should be provided with a suitable drain so that periodically the contaminants can be drawn off.

The important functioning parts of the fuel injection pumps on high-speed diesel engines are built to unbelievably close limits—less than one-ten-thousandth of an in., in some cases. Obviously, these



tions have brought to us and which have such a great effect upon our method of living.








Normally, we are a wasteful nation; and probably we can normally afford to be wasteful. Our scale of living is high. However, unfortunately, there come times when our ability to get new equipment and replacement parts is mighty strained. We are in one of those times again. Therefore, we must forego some of the pleasures of just buying what we want, and give serious thought to conserving



close fitting parts will not stand abuse from foreign material introduced to them in the fuel, and water is more detrimental than is dirt. The job of the fuel mechanisms is to meter the proper amount to each cylinder at the proper time. The slightest scratch or corrosion will start to upset this important cycle, with resultant loss of power, erratic operation, waste of fuel and, finally, down-time and loss of needed production. Buy your fuel clean; keep it clean.

Engine lubricants have but few

## CUT COLUMN FORMING IN HALF WITH ROOS COLUMN CLAMPS

<p>Just two units Both Alike</p> 		<p>Open Either Way</p> 
<p>Larger Bars Give Greater Strength</p> 	<p>● Contractors have stated that workmen can clamp two columns using Roos Column Clamps, in the time required to clamp only one column with a different type clamp. On your next job, try this simple answer to your clamping problems. Roos Column Clamps save every time you use them.</p>	<p>No Loose Parts</p> <p>Wedges Chained to Clamps</p> 
<p>FoolProof</p> <p>Impossible to put on Wrong</p> 	<p>Hammer only Needed to Tighten</p> 	



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Rooshors are the proven favorite of contractors from coast to coast. They are instantly adjustable within their range of three sizes—8 ft. to 14 ft.; 7 ft. to 13 ft.; and, 5 ft. to 9 ft. Higher stories are readily shored with the Roos Extension Shore. Rooshors are sturdily constructed, completely safe, yet are light enough for one man to handle with ease.

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jobs to do: They keep reciprocating metal surfaces from coming into direct contact with one another; and they assist in dissipating heat caused by internal friction and from the burning of the fuel in the combustion chambers. The lubricant must form a clean, positive film between the piston and piston rings to eliminate metal to metal friction. It must be capable of conducting the heat developed from the pistons and rings to the cylinder walls and on out into the cooling system to be further dissipated by the radiator and fan. Assuming that the lube oil is being used as recommended by the manufacturer, and the engine is of proper design, then the above will be true. However, if we carelessly permit dust and dirt to get into our lubricants, then the picture rapidly changes. The foreign material causes excessive wear on rings, pistons and cylinder walls. By sticking the rings, it causes excessive heat which the oil cannot withstand, so the lubricant breaks down. The oil cannot properly conduct this excessive heat to the cooling system, and trouble begins. The same is true of dirt and dust in the oil that reaches the bearing and journal on the crankshaft. Excessive heat is generated, and the oil just cannot stand up and do its job. Hence, premature bearing failures result.

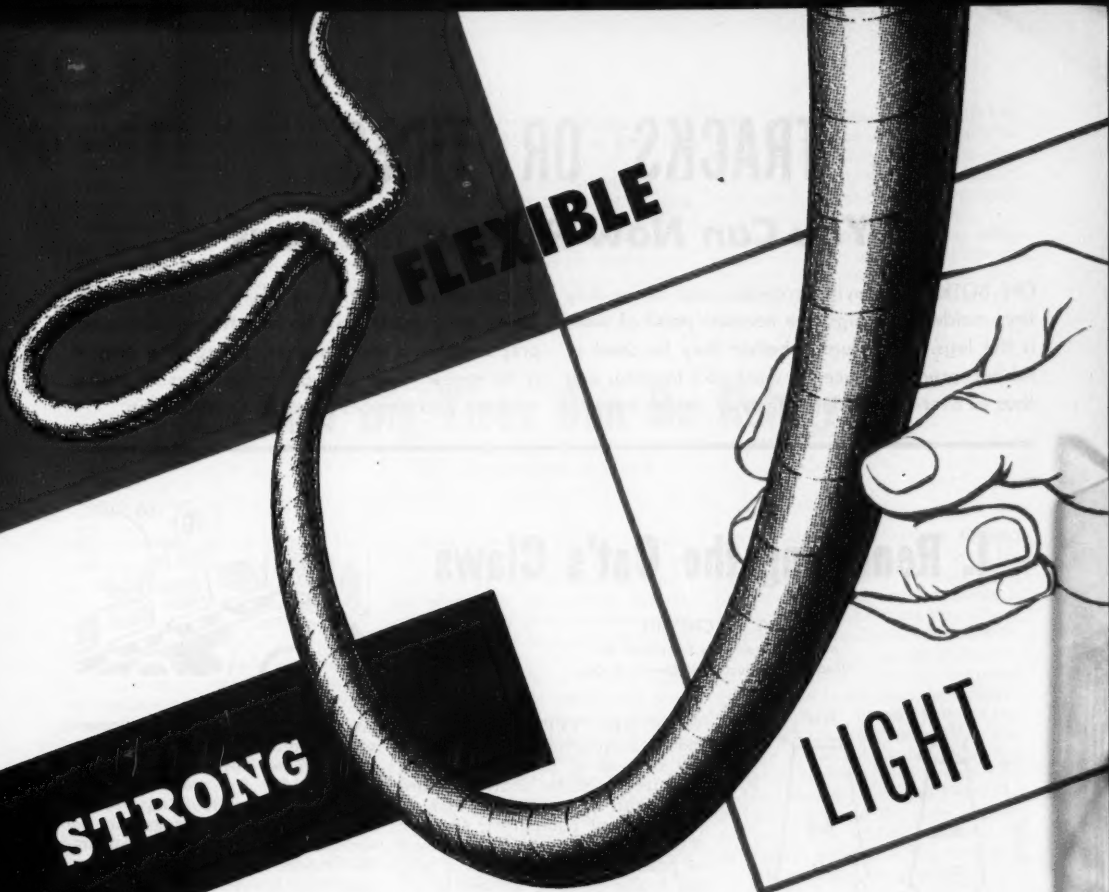
These are only some of the reasons why engines must be kept clean—common sense will tell you many more. And, if you only remember the Cleanliness adage, you'll keep your machines clean to keep them from going to Hell.

### Maintenance Tips...



COMBINATION gas and electric welding outfit is mounted on a truck by J. L. Bradley, Anahuac, Tex., for oil field construction and maintenance. Besides carrying a Lincoln arc welder, the rig features an acetylene generator for supplying gas to a cutting torch. Storage cabinets are built in over the rear wheels. Bradley also uses this outfit as a seagoing rig by rolling it on a barge for offshore work.—From Lincoln Electric Co., Cleveland, Ohio





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"... Everything we want in a hose!" • That's how users sum up the many advantages of Homoflex Hose. • That's why they order more and more Homoflex once they discover it's really a *different* hose . . . easier to coil and uncoil . . . no kinking . . . easier to carry and drag . . . lasts longer in "rough going". • Bulletin 6879D tells why the unique construction of Condor Homoflex makes a better hose for handling air, water, other fluids and gases. • Extra qualities are also engineered into our other hose, V-belts, flat belting and conveyor belts. Just phone your R/M distributor.



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# TRACKS OR TIRES...

## You Can Now Renew the Lugs

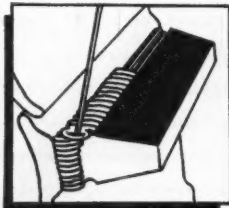
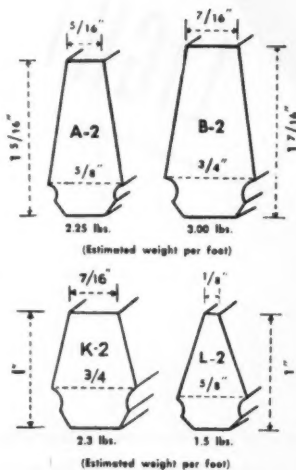
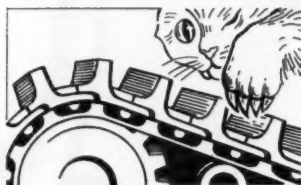
ON BOTH track-laying crawlers and heavy-duty tires molded with lugs, the heaviest point of wear is the lugs. Worn lugs, whether they be steel or rubber, greatly reduce the machine's traction, and thus its over-all working efficiency. In the interests

of conserving construction equipment and accessories, we present the following two articles, each prepared by a manufacturer, telling how easy it is to renew lugs on crawlers or tires by using methods and services they offer construction.

### 1. Renewing the Cat's Claws

By R. B. CHESSIN,

Manager, Machinery-Equipment Div.  
Allied Steel Products, Inc., Cleveland, Ohio



FOUR SIZES of Allied Steel's Grip-Lug bar are available for renewing lugs on tractor grouser shoes. Bars are cut to length, then welded to old shoes. First welds are made at ends with bars in vertical position; then tracks can be rolled to put bars horizontally for down-welding along sides.

WITH ALL TYPES of crawler-mounted equipment in critical supply because of military demands and steel shortages, contractors are faced with the problem of making their present equipment, whether it be old or fairly new, last as long as possible. Not only must it last, but it also must be worked to utmost efficiency and with a minimum of down-time for repairs.

Down-time, of course, is expensive time, both in direct repair costs and in indirect costs from loss of production while the machine is out of service. An even more intangible, but just as important, cost comes from inefficient operation due to loss in traction. Badly worn or broken lugs on the crawlers can reduce traction efficiency as much as 50%. Periodic visual inspection of track links and grouser shoes will reveal their condition, but other signs of inefficient traction are excessive slipping, lack of steady traction on hard pulls, and increased fuel consumption.

Worn grouser shoes can be restored to original size and shape by two methods: (1) By building up with successive welding passes, and (2) By welding a new lug to the worn section. The latter method offers a quick, economical way to restore grousers to original condition. For this purpose Allied Steel Products, Inc., has developed a special shaped bar in four sizes that can be cut off to desired length

and quickly welded to the grouser without removing the tracks from the machine. These bars are marketed under the trade name of Bulldog Tractor Grip-Lug.

The fact that the lugs can be welded in place without removing the crawler assembly is an obvious advantage in saving the down-time otherwise required to tear down and reassemble the tracks.

Application of the lugs is simple. First, the old shoes must be thoroughly cleaned and smoothed off, and uneven or rough spots ground down. The lug bar should be cut 3/8 in. shorter than the grouser width to allow for a 3/16-in. toe weld at each end. Cutoff is made with a torch or saw. Cutting on a 30-deg bevel, with the top or wearing surface shorter than the base, makes a better installation.

Because metallurgy of grousers varies with different makes of tractors, care should be taken not to fuse too much of either the grouser metal or the lug into the weld. A low hydrogen or mild steel welding rod is recommended, so both grouser and replacement lug must be preheated to 450 deg. Preheating also saves welding and permits use of a lower welding current which reduces the possibility of metal fusing into the weld.

Careful following of these recommended procedures will reduce the hazard of a too-brittle weld that may crack during cooling. Surface cracks, of course, can be de-

tected by close inspection, but a hidden crack may cause the lug to break off during service. However, proper welding virtually eliminates this possibility.

Experience has shown that all-year efficiency of crawler tracks can be increased by welding a short section of new lug bar at right angles to the transverse bar on alternate grousers. This practice

tends to reduce side slippage when the machine is traveling over icy ground.

Renewing or replacement of worn track links that support the grousers is also important to maintenance of track efficiency. For this purpose Allied Steel has developed a special plate that can be quickly welded to the old link. It is known commercially as Bulldog Trak

Renu Plate. These can be applied in a fraction of the time it takes to build up the links by welding or replacing them with new units, thus again reducing the down-time of the machine out of service.

These applications offer economical means of extending the life of crawler-mounted equipment and keeping it in top working efficiency.

## 2. Now Big Tires Can Be Relugged

By D. D. COOPER, President,  
American Tire Machinery, Inc., Muncie, Ind.

**BIG OFF-THE-ROAD TIRES**, the type molded with lugs so widely used for severe service on construction, often lose their traction efficiency through wear and damage to the lugs long before the casing is worn out, resulting in expensive tire replacement and down-time of the equipment. Tire men and engineers have long sought an economical and relatively fast method of renewing the traction of these big tires. Recapping has proved successful, but few firms outside of major rubber companies can afford the necessary equipment, and long delays of 4 to 10 weeks often occur before the tires are returned.

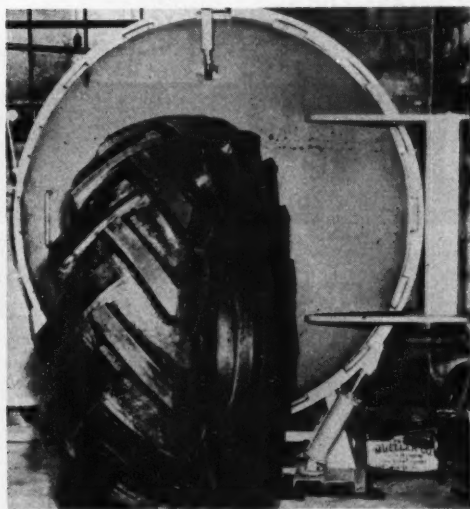
Leading tire manufacturers have tried for years to replace only the lugs with faster, cheaper methods. But problems of uneven curing, lug shape and other factors often caused the lugs to come loose after a short time.

Vaughn Rawls, a former Alabama farmer, has teamed up with American Tire Machinery, Inc., to perfect the first successful tire relugging method. Working in tire shops and rubber factories for the last 20 yr, he had been studying and experimenting with the problem of tractor tire wastage. Rawls proceeded to change the method of making the lug and tried doz-

ens of lug shapes before finding the one that would work best. He also experimented with many types of cements used in the process. Finally, he got to the point where he needed a steam chamber to perfect his idea, and he found American's patented Vitacap chamber (actually a huge pressure cooker) was just what he was looking for.

Rawls' idea for relugging was unique in that it required perfect temperature control in every step of the process. He found the Vitacap ideal to cure the new lugs on the worn tire, and to complete all necessary repairs to the casing at

(Continued on page 130)



**MASSIVE, EXTRA-HIGH** lugs have been placed on this 21.00x24 tire by the Vacu-Lug process, restoring it to many more miles of efficient service. After minimum amount of rubber has been buffed off worn lugs, new lugs are cemented on and vulcanized in Vita-Cap steam chamber in background.



**HOW RELUGGED TIRES** stand up is shown by this view of two reclaimed 18.00x24 tires on a 15-yd Euclid after 6 months service in a quarry. Relugged tires actually showed less wear than two new tires on opposite wheels installed at same time for test purposes. Tires can be relugged in any pattern desired.

# Grand Champ

**Carroll Brown's big red TD-24 wins out on Colorado's  
"toughest road construction job ever!"**

This summer, tourists welcomed the new wonder highway to the gleaming trout lakes atop Grand Mesa. But the men who built it called it "The Snake Pit"—a two-mile-high inferno of falling rocks, dynamite-proof basalt, and even prehistoric ice on the high north slopes where the sun never shines.

They had to clear out 300,000 cubic yards of snow before they could start building. They could work only from June to October each year—and they had to make a two-hour trip to the job each day because the air on Grand Mesa was so thin men couldn't stay at the job site.

It took five years and a million dollars to build six miles of highway—nearly a year and two hundred thousand dollars a mile. Carroll Brown, of the Brown Construction Company, finally finished

the job with flying colors, and he came up with this conclusion:

"On this most difficult project our company ever tackled, under the severest conditions we ever encountered, the International TD-24 tractor definitely outperformed all competitive equipment."

Once again the big red crawler had proved itself the Champ. The Champ for tough, dogged, never-give-up guts—148 maximum horsepower at the drawbar, 8 speeds forward, 8 reverse, Planet Power Steering with finger-tip control.

Ask your International Industrial Distributor for the real low-down on the TD-24. It's backed by complete parts supplies and service facilities for the hard-working years ahead. Get the whole story. You'll be a TD-24 man from then on in!

**INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS**



## INTERNATIONAL

**POWER  
THAT PAYS**



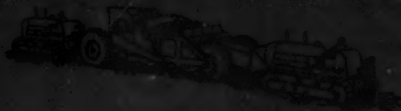


# of Grand Mesa

**TWO MILES HIGH** on Grand Mesa, an International TD-24 dozes more rock with more speed on new million-dollar highway. Volcanic rock, dense-grained basalt proved a pushover for the big red Champ.

GRAND MESA  
2 MILES

DENVER  
1 MILE



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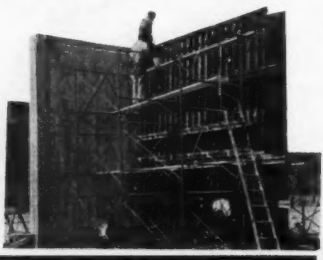
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20 Vesey Street New York, N. Y.



BEAUTIFUL EXAMPLE of custom-built relugging of badly-worn grader tire. In addition to S-curved traction lugs, this tire was rebuilt with a heavy straight wearing rib.



BEFORE AND AFTER relugging. These two tires are off same rig. The improvement in traction efficiency is certainly obvious.

the same time. Companies which had worked on relugging tires and even American Tire knew that Rawls' process was entirely unorthodox—but it worked!

One of the leading tractor tire manufacturers, after 2 yr of tests and experiments, has recently endorsed the method, now called the Vacu-Lug process, as "the best method of restoring maximum traction to worn tractor tires at the least possible cost." Just how well these relugged tires perform has been fully demonstrated by tests of their traction and wear.

A pulling test between two identical farm tractors of the same horsepower chained together, one with relugged tires and the other with brand new ones, resulted in the tractor with Vacu-Lugs pulling the other backward with its wheels spinning. This greater traction comes from the higher, flatter tread furnished by relugging, putting more tread rubber on the ground.

In another test, a tractor was chained to a tree while its relugged tires were spun on the gravel road until they smoked, yet close examination showed no signs of rapid wear or any loosening of the lugs. Now, Vacu-Lug shops guarantee the lugs to stay on, since they are cured to the worn tire like a weld—with the same increase in strength.

Near Columbus, Ohio, a dual set of relugged 18.00-24's were tested against brand new tires on a 15-yd Euclid dump truck carrying 35,000 lb. of limestone from quarry to crusher. After six months of

hard use (16 hr a day, 6 days a week) the relugged tires clearly showed far less wear than the new tires.

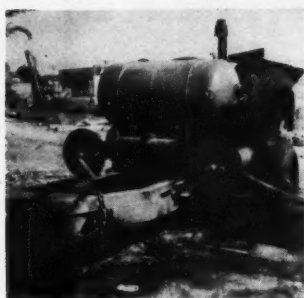
In northern Illinois, several county highway departments have cut their tire maintenance costs in half, extending mileage and gaining extra traction with relugged tires on their road graders.

At present, there are 56 Vacu-Lug shops in 23 states, also others in Canada and England, relugging and repairing tractor and off-the-road tires in often less than 72 hr. Sectional, reinforcement and spot repairs are handled at the same time, cutting down-time considerably. Present equipment will relug and repair tires up to and including the giant 21.00x25 earth-movers.

### Maintenance Tips...

ALL YE CONTRACTORS interested in keeping your General Motors diesel engines in top condition will be glad to learn that Detroit Diesel Engine Division of General Motors (they make the engines for you) are pushing their mobile diesel engine training schools all over the country. These schools operate the year round, and if you're interested in having your mechanics and operators attend, get in touch with your Detroit Diesel distributor, who makes up the schedules. They'll bring the mobile school right out to your job for a two-day training course.

## Maintenance Tips...



PIPELINE CONTRACTOR Alex Robertson Co., Los Angeles, altered 20 of their air compressors like this one for more efficient use and better road travel. Changes and additions made in their own shop include a welded extension of the frame to serve as a rigid tongue; moving the rubber-tired wheels backward for better balance; two hand-cranked reels made up of end plates welded to short pieces of pipe, each capable of holding 200 ft of 3/4-in. air hose; and their own design automatic tool oiler mounted at receiving tank outlet. Robertson mechanics are proud of this oiler which puts a fine spray into the airline, eliminating former trouble of oil globules forming in the hose. It needs to be filled only twice a week. The hose reels are live, that is, a line from receiver hooks into the end of spool core and the air supply lines are permanently connected to the drum, so they can be used without constant coupling and uncoupling. — From Lincoln Electric Co., Cleveland, Ohio.

CLEANING THE FINS of a tractor radiator can best be accomplished by means of an air blast carrying a grease solvent, such as oleum spirits or carbon tetrachloride directed at the front side of the core and passing through to the back, or the fan side. Never use gasoline, fuel oil, or kerosene. The radiator grill and fan shroud should be removed from the radiator and the engine should be covered before performing this operation. Note: Provide adequate ventilation of the working area during this operation to avoid possible toxic effects of the cleaning spray. — From Allis-Chalmers, Milwaukee, Wis.

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VERSATILITY—

## with SIMPLEX RATCHET LOWERING JACKS

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full capacity  
lift on  
Cap or Toe!



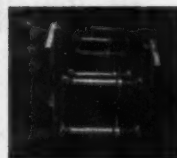
For every jacking job—pushing, pulling, raising, lowering—you'll find Simplex Jacks give you more for your money... have a wider range of usefulness.

Simplex Ratchet Lowering Jacks are available in capacities from 1 1/2 tons to 35 tons... with full capacity lift on cap or toe! Fast and safe, they operate notch by notch on the downward stroke of the lever—cannot be tripped. Speed trigger—used to drop rack bar to desired position for extra speed—can be operated only when there is no load on Jack. For safety's sake... insist on Simplex.

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### SCREW JACKS



A single large steel pivotal ball, nested in a hardened ball seat under cap, centers the load on Simplex Heavy Duty Screw Jacks and reduces friction by 88%. Ball won't flatten—cap can't slip. 4-way and Ratchet Head Types. Available in 31 models of 10 to 24 ton capacity.

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## Simplex

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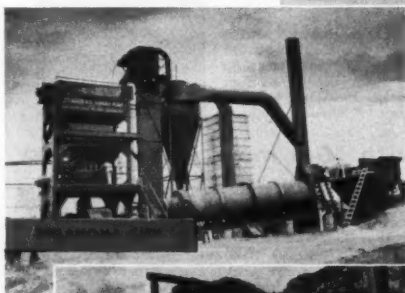
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## We Mobilize for Freedom

# CONTROLS . . . A Two-Edged Sword

It may seem dangerously premature to talk about getting rid of emergency government controls while all-out war is still an imminent possibility.

But success in this strange struggle for our freedom into which the Russian Communists have plunged us requires that we:

1. Maintain a whole battery of controls designed to speed defense production and curb inflation, and at the same time
2. Work to end the controls at the earliest possible moment.

Here is the reason why this editorial—fourth in a special series on mobilization for defense—is devoted to the need for a speedy release from controls.

*If the Russian Communists can force us to maintain indefinitely the present system of government controls, they will have won a tremendous victory.* They will have saddled us with a system of collectivism which, over a period of years, would be fairly certain death to freedom of business enterprise.

Make no mistake about it. This is not an argument against emergency controls. We need controls now to break a right of way for

our mobilization program through the business boom. Indeed, the third editorial in this special series was titled "Why Controls Are Necessary." It stressed both the need for controls and the need for positive cooperation to make them work.

### Controls Can Undermine Our Economy

But these controls surely chisel at the foundation of our normal economic system. So long as we have them, many if not most key business decisions will be made in Washington bureaus rather than in the free market place. For example, the *National Production Authority* administers a *Controlled Materials Plan* (italics ours) which directs the flow of basic metals, and decides who can use them for what purposes.

Happily, the people who operate these controls are not using the methods of a secret police state.

Even more happily, most of the leaders who have been drafted to manage the controls are not in love with their jobs. They are doing their best in the thankless task of making controls work. They recognize the danger of chronic controls.

But the fact remains that our economy is

operating under arrangements which carry it a long way toward the pattern of centralized control the Russians would inflict on the world.

### **The Wilson Plan**

A plan for getting rid of these controls has already been developed. It was put together by our Director of Mobilization, Charles E. Wilson — while he was working day and night to set up the necessary emergency controls.

The Wilson Plan — if we escape all-out war — will strengthen our defenses and our economy. By 1953, it calls for:

1. Providing the weapons to equip an armed force of 3½ to 4 million, together with a supply of weapons for our allies.

2. Building a stockpile of weapons which, with current production, would be sufficient to carry on an all-out war for a year.

3. Building the manufacturing capacity by which we could rapidly expand our production of weapons if all-out war should come.

4. Increasing the productive capacity of industry enough to resume the expansion of our civilian economy.

With these jobs done our economy would be big enough and strong enough to meet both civilian and military requirements. And the government controls needed for mobilization could be speedily dropped.

### **Call for Sacrifice**

The Wilson Plan requires a major effort — it means spending more than \$50 billion a year for mobilization. That is almost 20 percent of our total production. And this cannot be done without sacrifice. For a time, particularly in the next year, living standards will drop.

But the sacrifice required is amazingly small. At the peak of the defense effort, civilians will still have available to meet their needs about as much as they did in any year before 1948.

To make the Wilson Plan succeed we must curb inflation. A second year of inflation such as that which we have had since the Korean war started would multiply disastrously the costs of our defense program. One key part of a successful program to curb inflationary pressure, which soon will be building up again, is a pay-as-we-go tax program. The second editorial in this series urged that we do our utmost to pay as we go.

### **We Cannot Out-Control the Communists**

But, above all, to make the Wilson Plan work we must keep our sights set on the crucial importance of increased production. Our problem is to increase our capacity to produce so that we can carry both a major military program and an expanding civilian economy for as many years — General Bradley thinks it might be fifteen or twenty — as the menace of Russian Communist aggression persists.

If we do not produce enough to do this double job, we shall be confronted with the prospect of having to live indefinitely under government controls of the sort that have been set up since the start of the Korean war. That would be delightful to the Russian Communists. It would go far toward making over our economy on the Moscow model.

Even if we wanted to, we never could hope to out-control the Russians. They are miles ahead of us in that line. But we can out-produce them, by a tremendous margin. By doing that we shall travel the surest road to victory.

**McGraw-Hill Publishing Company, Inc.**

# You get 5 proven advantages

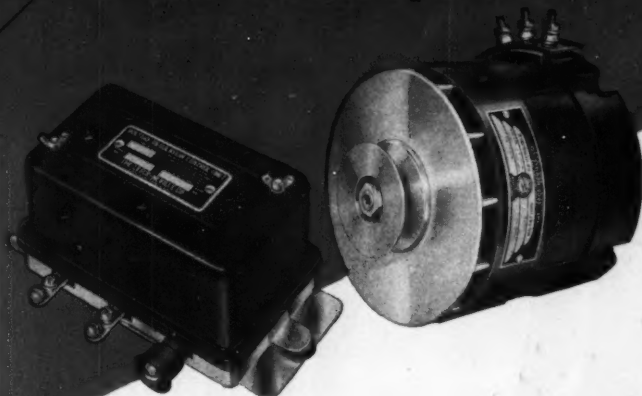
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The modern need for more amperage is soundly provided through the exclusive L-N Alternator System—available in units serving from 50 up to 175 amperes. For years the L-N Alternator System has been in use on thousands of vehicles, delivering ample current for all accessories and insuring full life of batteries.

The "watch dog" of this great electrical system, the patented L-N Voltage Regulator, has all the L-N characteristics of rugged design and construction, plus sensitive control that assure dependable and sufficient electrical output for every type of service.

And like all L-N electrical units, this regulator is so designed and constructed that maintenance adjustments, if and when necessary, are generally practical without recourse to complete unit replacement. *In these days that's important.*

THE LEECE-NEVILLE CO., CLEVELAND 14, OHIO

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# CLYDE BAND FRICTION HOISTS DELIVER IN THE CLUTCH!

A Clyde Frame 5  
Gas Hoist "on  
the job" for the  
L & R Construc-  
tion Co., St.  
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*...and cuts handling costs!*

## HERE ARE THE FEATURES YOU GET WITH CLYDE!

• Extra quality in a hoist permits handling heavier loads faster, easier and more economically. Clyde hoists incorporate all the design and performance advantages that satisfy the requirements of leading contractors all over the world. Safety engineered features that assure fatigue-free operation . . . permit operator to spot loads easily and accurately . . . slash material handling costs.

### CLYDE Friction Clutches

. . . are actuated so easily that they take full capacity loads with minimum of effort on operator's part. Engagement and release is smooth and sure for perfect load control. Internal bands dissipate heat quickly, allow larger friction bands for efficiency and ease of operation. Simple to adjust, easy to maintain.



• All levers conveniently banked to operator's comfortable seat • Two-piece internal expanding band frictions, simple adjustment. Chain adjustable without removing guard • Full view of drums from operator's seat • Available in 1, 2, or 3-drum sizes • Large brakes allow the operator to "toe" the brake with full load control • Ball and roller bearing mounted shafts throughout • 8,000 pound line pulls at high speeds . . . the ideal hoist for handling a one yard bucket.

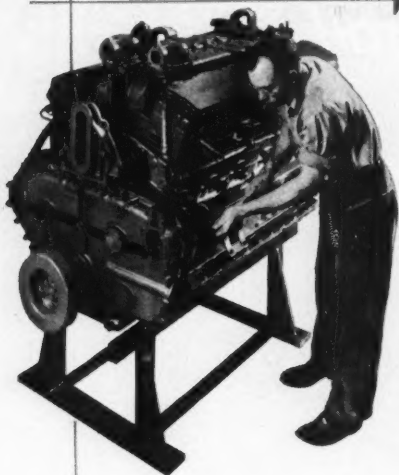
WRITE FOR FREE ILLUSTRATED FOLDER CONTAINING DETAILED SPECIFICATIONS ON THESE MODERN HOISTS!

Hoists • Derricks • Whirlies • Builders Towers • Car Pullers • Handi-Cranes • Rollers •  
**CLYDE IRON WORKS, Inc.**  
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Subsidiary of Barium Steel Corp.



**BUILT NOT ONCE BUT**

**→ TWICE!**

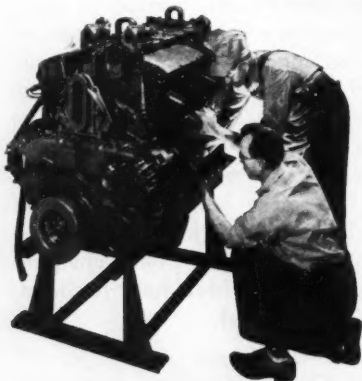


Cummins is the custom-builder of the Diesel industry. Each engine is built to *fit the job*—and the individual piece of equipment in which it is to be installed. And *every* Cummins engine is built *twice*. First, each engine is assembled, run-in tested. Then it is disassembled completely, and inspected. Finally it is reassembled and tested *again*. This extra care in precision building, Cummins exclusive fuel system, efficient parts and service organization... mean *less "down-time"* and *more power and profits* for Cummins users. See your Cummins dealer.

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# Diesels



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**Diesel power by  
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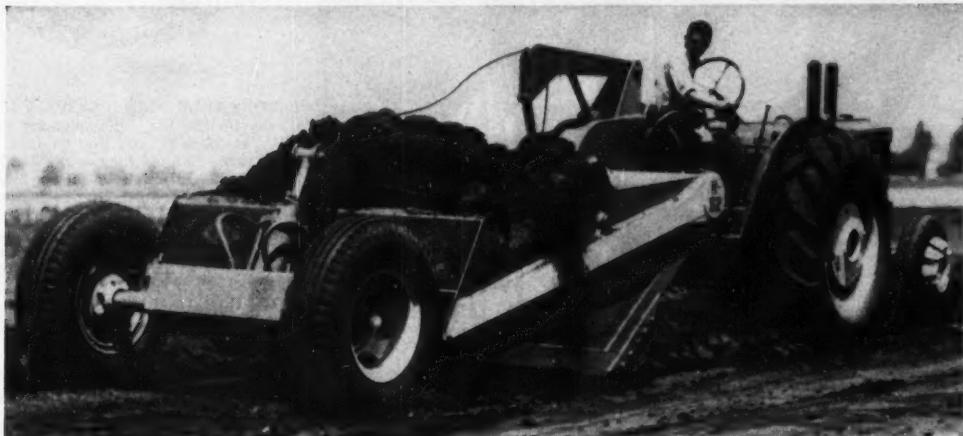


TRADEMARK REG. U. S. PAT. OFF.

# CONSTRUCTION EQUIPMENT NEWS

*A Preview of New Machinery, Tools and Equipment That Will Help You on the Job*

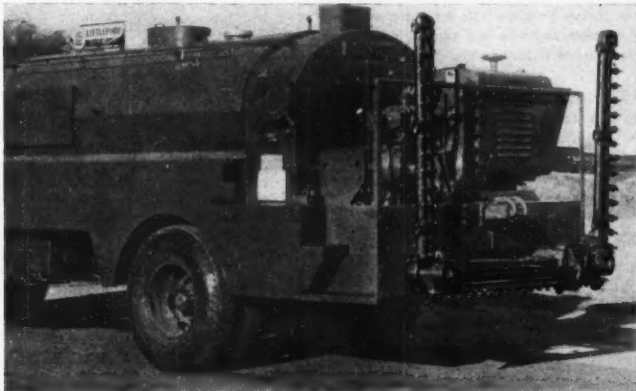
By MELVIN DEAN, Equipment Editor



## Two-Wheel Hydraulically Controlled Scraper Works at Speeds to 12 Mph

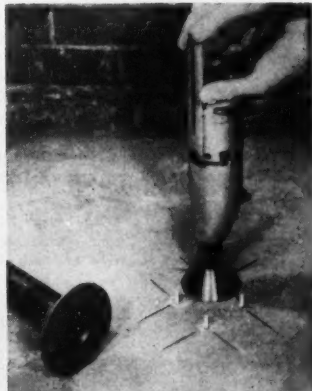
Six-yard scraper is matched equipment for the John Deere Model R diesel tractors. The Model H-62 is a two-wheel hydraulically controlled unit, and will operate at speeds to 12 mph. A special hitch, mounted under the tractor rear axle, eliminates the front wheels of the scraper and transfers a portion of the scraper load to the tractor driving wheels for greater pulling power. The scraper is self-loading and self-spreading. It features a low center of gravity, a high road clearance that permits easy hauling over ditches and levees, an inde-

pendent front apron, and a rear apron that wipes the scraper bowl clean as the load is dumped. Cutting edge width is 7 ft; turning radius of tractor and scraper combination is 15 ft 6 in.; weight of scraper, complete with hitch assembly, approximately 7,670 lb. Scraper can be had with single or dual tires. Front-wheel assembly may be added for 4-wheel operation. Simple yoke design and absence of overhead structure provide operator a clear view of the work area.—American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif.



**CIRCULATING SPRAY BAR** of extremely light weight can be lifted easily by one man. Of the barnd-folding type, it has a 24-ft width. Mounted on a Littleford distributor, the Lite-Wate sprays by pressure and circulates materials by vacuum, assuring clean, even starts, instant shut-off without drip, and suckback

of any material left in the bar after spraying. Lengths of bar may be added quickly by loosening only two bolts. When spraying, all nozzles open instantly and simultaneously. Each nozzle can be turned off individually to provide any desired width of spray.—Littleford Bros., Inc., 443 E. Pearl St., Cincinnati 2.



**SELF-POWERED STUD DRIVER** can set five or more studs a minute in concrete, steel, and other materials. Power is supplied by a 32-cal Long rim fire blank cartridge. Studs vary in length from  $\frac{3}{8}$  to 2 $\frac{3}{4}$  in. long, in 20 different types.—Remington Arms Co., Inc., Bridgeport 2, Conn.



**BUILT BETTER** *for*

- SPEED ON THE JOB
- ENDURANCE IN THE FIELD
- LONG-RUN ECONOMY

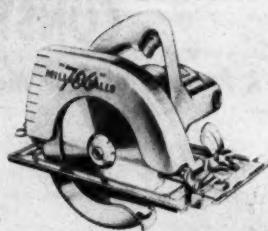
**FOR ROAD BUILDERS**—who demand longer-lasting and trouble-free equipment there is no better buy than Heltzel steel forms, Heltzel portable bulk cement plants and Heltzel portable aggregate plants. On every concrete highway and airport project you will find men who know the dollars and cents value of Heltzel equipment.

**PORTABLE BATCHING PLANTS**—Portable aggregate plants in capacities of 30, 45, 52, 72, 85 and 100 tons. Portable bulk cement plants in capacities of 100, 200, 300 and 400 barrels — and 9 sizes of portable recirculators to assure reserve storage to meet every requirement. Standard batchers will service 34E pavers — or dual batchers for the fastest batch truck operation obtainable.

**HIGHWAY-AIRPORT FORMS**—Standard forms for highway and airport construction are all-welded steel — featuring wide tread, upturned base flange and 5 rigid supports per form. Heltzel's exclusive dual duty forms are demanded by contractors who want one set of forms to pour two slab thicknesses from 6" to 24."

Write for 9-piece kit of contractors' literature

**HELTZEL**  
STEEL FORM & IRON CO.  
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**PORTABLE 7-IN. SAW** — Light weight (11 lb), high capacity (2 $\frac{3}{4}$  in. at 90 deg), and fine balance are features claimed for the No. 700 7-in. saw. It will make a 45-deg mitre cut in finished 2-in. lumber. Power is provided by a  $\frac{1}{2}$ -hp motor. Using abrasive disks, the 700 can be used for cutting metals, concrete, and tile. —Millers Falls Co., Greenfield, Mass.

**HIGH-HEAD PUMPS** — Two-stage Type DMD pumps are made in sizes from 2- to 10-in. discharge with capacities to 4,000 gpm and heads to 750 ft. Features include a horizontally split casing with interconnecting passage between the two opposed impellers, and non-overloading, balanced impellers. —Economy Pumps, Inc., Div. of Hamilton-Thomas Corp., Hamilton, Ohio.



**BUILDERS' DUMPY LEVEL** — Short, compact dumpy level is specially designed for construction and irrigation work. The telescope is 13 in. long with external focusing and with a 1 3/16-in. objective lens. Achromatic lenses produce a flat field and a magnification of 19 diameters. Spiral screw in eyepiece provides accurate focusing on cross-hairs. Effective aperture is 1 $\frac{1}{4}$  in.; minimum focus is 6 ft and true field is 1 $\frac{1}{2}$  deg. The 5 $\frac{1}{4}$ -in. long spirit level is sensitive to 60 sec of arc per 0.1-in. graduation. Weight, 7 lb. —Leupold & Stevens Instruments, Inc., 4445 N. E. Gilman St., Portland, Ore.

**EXPANSION-TYPE BELLOWS** — Bellows of convoluted metal diaphragms absorb high-frequency vibration and lineal expansion. They are available in various lengths with internal diameters of 1 to 5 in. Height of convolutions varies according to flexibility required. Wall thickness is determined by pressure requirements. —Titeflex, Inc., 500 Frelinghuysen Ave., Newark, N. J.





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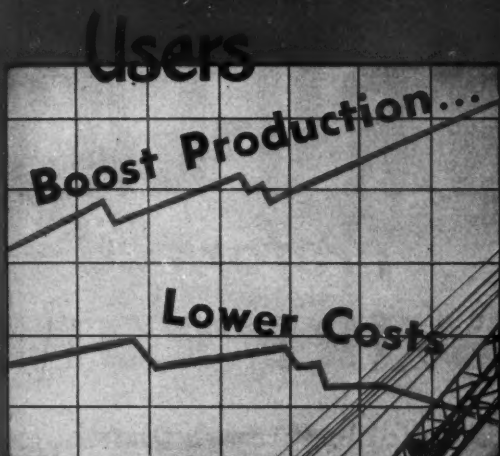
Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles,  
New York, Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

**AMERICAN CHAIN & CABLE**  
**AMERICAN CABLE DIVISION**

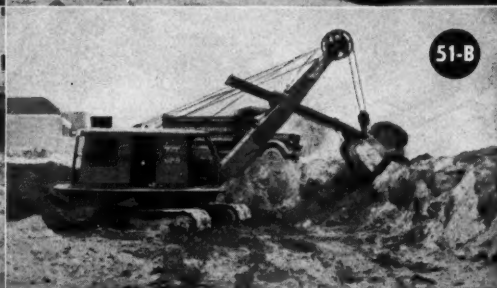
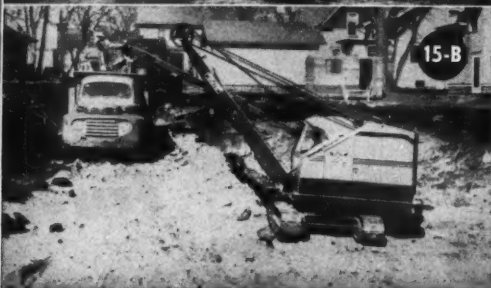
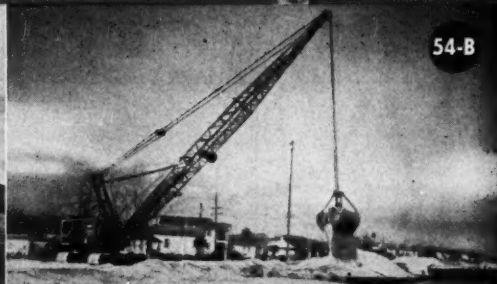


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*Preformed*  
**Wire Rope**



**with**  
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Helping contractors get new speed, efficiency and economy in their operations is an old story to Bucyrus-Erie excavators. They've done it on a thousand-and-one different jobs — as shovels, cranes, draglines, clamshells and dragshovels.

It's easy to match job requirements exactly with one of the machines in Bucyrus-Erie's 3/4- to 4-yard line of gasoline, diesel, or single motor electric

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There's strength behind this top-notch line, too ... your Bucyrus-Erie distributor. He's staffed and equipped to give you the service you need, when and where you want it.

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# 1 of 10 Reasons Why UNIT is a Better Machine

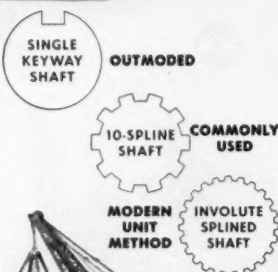


## ...FOR GREATER STRENGTH AND PEAK EFFICIENCY

A vital link in the strength, toughness, and durability of UNIT equipment is the use of involute-splined shafts. Compare the 3 shaft drawings and note the superiority of involute splining. In the outmoded, single-keyway shaft, the driving force is concentrated at one point, making it the least efficient and subject to easy breakage or wear. The 10-spline shaft, commonly used in the industry, is a great improvement over the single-keyway—but is still not the most efficient! Involute splining is better able to take the severe beating of daily use. Its multiple splines allow a greater area of contact with the mating member, providing a more equal distribution of driving force under load. As a result, wear is reduced and replacement is seldom necessary. Involute splining requires less tooth-depth, eliminates sharp corners, thus making possible a shaft of greater diameter and strength. Only the advance design of involute splining gives full, peak efficiency—the reason it is used in every UNIT machine.

## UNIT CRANE & SHOVEL CORP.

6305 W. Burnham St., Milwaukee 14, Wis., U. S. A.



UNIT 614  
1/2 Yard

Has some rugged construction usually found in machines of greater capacity. Get the facts. Write for literature.

This is the 8th of a series of 10 ads describing outstanding UNIT features.

Crawler and Mobile models—1/2 and 3/4 Yd. Excavators. Cranes up to 20 tons capacity.

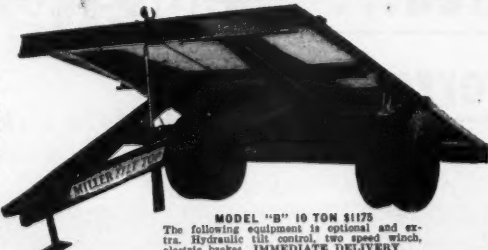


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If you use a  
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MILLER Tilt-Top

Heavy machines are easily driven or winched onto the tilted platform by one man... saving valuable man hours and providing extra portability for your equipment. Although low in cost MILLER Tilt-Tops are carefully engineered and ruggedly built. Standard platform is 14' by 8', optional 16' available. Platform, tires, Timken bearings, plow eye and dual Budd wheels are all standard equipment.

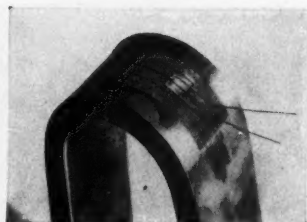


MODEL "B" 10 TON \$1175

The following equipment is optional and extra. Hydraulic tilt control, two speed winch, electric brakes. IMMEDIATE DELIVERY.

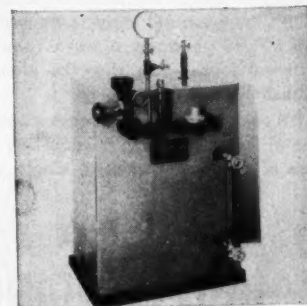
MILLER RESEARCH ENGINEERS

DEPT. C-7, 725 W. BURNHAM ST.  
MILWAUKEE 4, WIS.



**STRAIN GAGE**—Measurement of strains up to 10% in materials or parts are possible with the Post-Yield SR-4 strain gage. Identified as Type PA-3, it enables measurement of strains beyond the range of standard SR-4 bonded-resistance wire-strain gages. It has a flat-grid paper-base construction and requires a special air-drying cement supplied with it. The PA-3 has a resistance of 120 ohms, gage factor of 2.0, gage length of 13/16 in., and minimum trim width of 15/32 in.—Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

**ANTI-CORROSIVE COMPOUND**—Corrosanti Grade B compound is especially prepared for the protection of ferrous metals subjected to water and water vapor. Acting as a rust inhibitor, it penetrates rust formations that cannot be readily removed. It is said to cause the rust to flake off. Upon reaching bare metal, it closes the metal pores, preventing further rusting. Corrosanti is applied with a short, stiff-haired brush and will cling to wet or rusted surfaces. It can be applied under water.—Dr. Adolph Schrorr, 52 Cambridge St., East Orange, N. J.



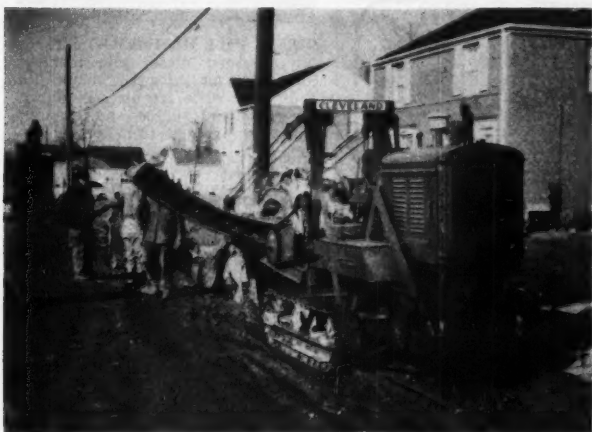
**LOW-PRESSURE BOILER**—Two lower-pressure boilers in the 1 1/2-hp range are the Model LP (maximum pressure, 15 psi) and the Model 400 (maximum pressure, 50 psi). These Series 1 1/2 boilers are 14 in. wide, 22 in. long, and 28 in. high. They require a 15-kw power input for maximum steam output. Heat is generated by resistance of the boiler water to the flow of current between solid metal electrodes.—Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass.



**longer service life  
lower maintenance**



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CLEVELANDS famous ruggedness means longer working life, as proved by the high percentage of early CLEVELANDS still in daily use, plus the unusually low maintenance costs shown in contractors' records. This remarkable toughness is the product of 30 years of continuous CLEVELAND engineering. CLEVELANDS sturdy strength comes from advanced structural design rather than clumsy beef and dead weight. Unit-type assembly means the few necessary repairs are done quickly and easily in the field. Plenty of brute power for the roughest job is directly applied through husky transmission units kept always in proper alignment by the special CLEVELAND frame and boom. Built into every CLEVELAND is a wide margin of safety on stress and strain that means many extra years of trouble-free service. See your nearby distributor today.



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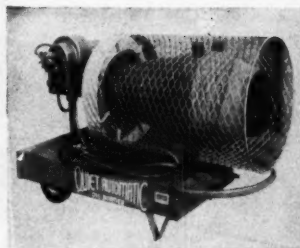
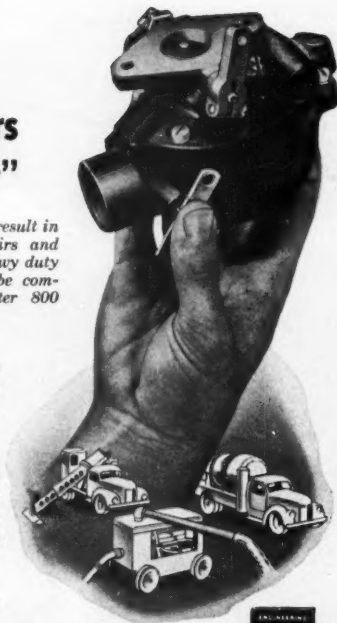
**Engineers say:** "Worn carburetors result in gasoline waste, expensive repairs and poor engine performance. On heavy duty equipment, carburetors should be completely rebuilt or replaced after 800 work hours."

**TAKE** this tip from men who know—and make your replacements with Marvel-Schebler Carburetors.

Because of their rugged strength, unusual dependability and economy of operation, Marvel-Schebler Carburetors are original equipment on many industrial engines and tractors.

**MARVEL-SCHEBLER PRODUCTS DIV.**  
Borg-Warner Corp., Decatur, Ill.

### MARVEL-SCHEBLER CARBURETERS



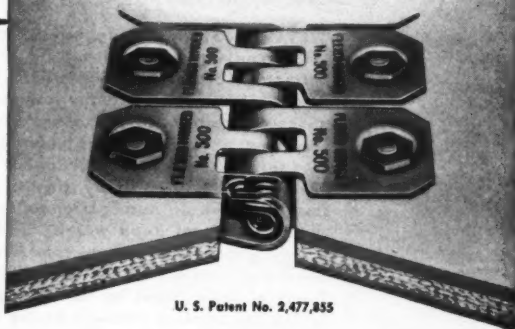
#### RADIANT-TYPE SPACE HEATER

—Portable, automatic heater is recommended for outside or for inside construction work, for space heating, drying plaster, and similar applications. Air is forced through the gun of the automatic oil burner by a motor-driven axial blower. As air leaves the gun, it is split so part moves over the outside of the combustion chamber. (The other is used at the nozzle for combustion.) The heater burns No. 2 fuel oil, and is rated 200,000 Btu. Power is provided by a 110-v current. Over-all dimensions are 4x2x3 ft.—**Quiet Automatic Oil Burner Corp.**, 33 Bloomfield Ave., Newark 4, N. J.



**DIESEL PILE HAMMER**—Improved self-contained diesel pile hammer (described for the first time in our Sept, 1949, issue) requires no auxiliary equipment, such as steam boilers or air compressors, to maintain pressure. It is 15 ft 6 in. long, has a 20-in. dia, weighs 11,000 lb. The hammer delivers driving energy at the rate of 16,000 ft/lb stroke, and is capable of 85 strokes per min. Weight of the ram or the striking part is 5,400 lb; maximum power stroke is 4 ft. Hammer fits in standard 20-in. leads, and can be easily handled by a gasoline or diesel-operated crane. It requires two lines—one for lifting the hammer; the other for lifting the pile and for starting the hammer by lifting its piston. One-man operated, force of each blow is remotely controlled by a hydraulic system and can be varied from zero to full power. Unit will idle without impact and without stalling.—**Syntron Co.**, 500 Lexington Ave., Homer City, Pa.

### ... the new separable FLEXCO HINGED BELT FASTENERS



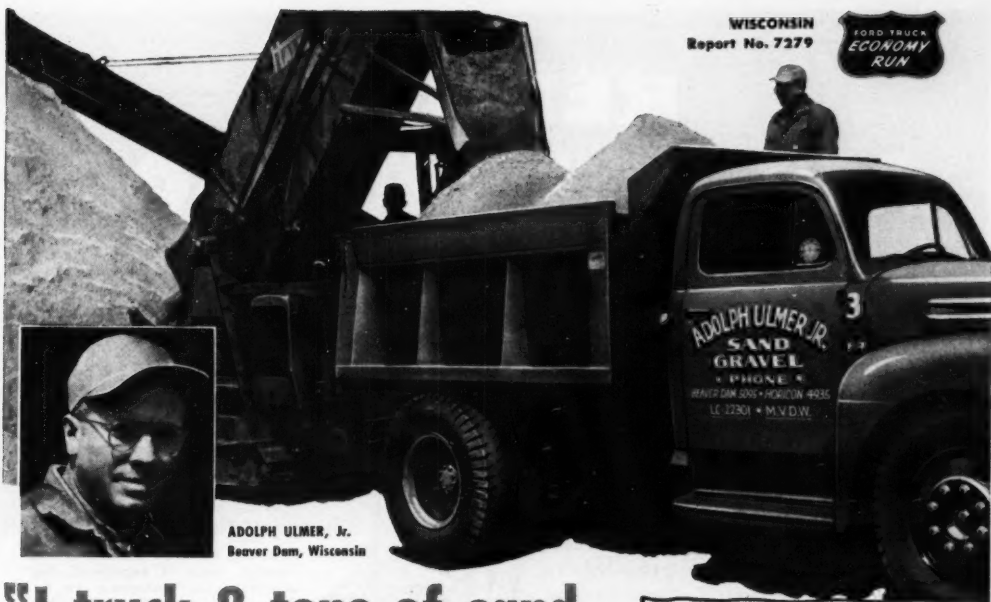
U. S. Patent No. 2,477,855

- ✓ For joining grader, trencher, ditcher and other earth moving conveyor belts.
- ✓ For belts  $\frac{3}{8}$ " to  $\frac{1}{2}$ " thick.
- ✓ A FLEXCO fastener that is HINGED. Has removable hinge pin.
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Order From Your Supply House. Ask for Bulletin HF 500.

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Beaver Dam, Wisconsin

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Ulmer says, "On tough jobs my F-7 Ford Truck with POWER PILOT is economical, and I also get all the power I need."

Ulmer was one of 5,000 owners who entered the nationwide Ford Truck Economy Run. He kept daily running cost records on his 1950 Ford F-7 Dump and reports: "My truck traveled 18,955 miles in rough going with an average load of 16,000 lbs. My running

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This new 145-h.p. Ford F-8 Big Job with special dump trailer has power reserves that construction men really appreciate! Tractor-trailer gross combination weight rating is 39,000 lbs.

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## POWER PILOT helps CONSTRUCTION MEN hold down hauling costs

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Full Line ☐ Heavy Duty Models ☐  
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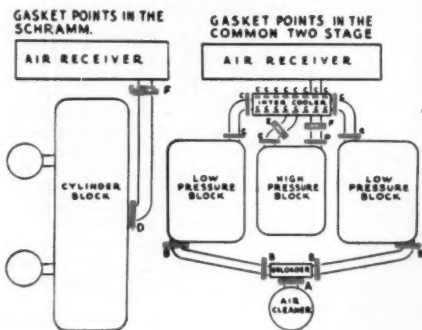
# REDUCE AIR COMPRESSOR MAINTENANCE

**... And Save Man Hours and Dollars!**

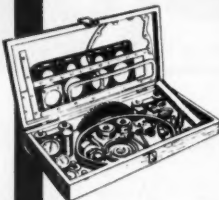
SCHRAMM AIR COMPRESSORS offer not one, but *three* ways to reduce compressor maintenance. From each you effect great savings... savings provided by SCHRAMM exclusively... savings that result from service.

## SIMPLIFIED DESIGN

None of the complications of the two-stage air compressor... fewer parts... up to 90% of the parts interchangeable between engine and compressor and between sizes of compressors... controls all on one side for easy accessibility, easy service.



## SERVICE KITS

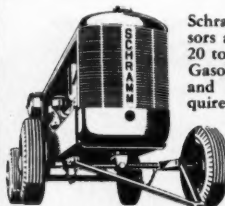


Only Schramm has available service kits for each compressor. Kits contain those parts most likely needing replacing, based on actual checking through years of experience. Big advantage: for emergency use, reducing "shut-down" time when there may be delay in reaching the Dealer. Also in combat zones, and remote sections of the world. Truly, a "Preventive Insurance."

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Schramm dealers are world-wide, *qualified*. Practically every serviceman is factory trained, to know *your* Schramm as he does his right hand. Dealers carry stocks of machinery and parts, and Service Kits, for easy, quick delivery.



Schramm Engine Driven Compressors are built in sizes ranging from 20 to 600 cu. ft. actual air delivery. Gasoline and Diesel engine drive and mountings to suit every requirement.

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You are familiar with our complete line of versatile air compressors, which offer many exclusive advantages, but when you specify SCHRAMM you are in a position to *save further* by taking advantage of our carefully-planned service. For the many details which make SCHRAMM your best air compressor buy, write us today.

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USING every possible way to save construction materials, time and money is always important. Today it's doubly so. And one of your best ways is with Monotubes. Just see the advantages you gain with these cast-in-place steel piles!

### MATERIALS CONSERVED

Monotubes' tapered design and cold-rolled properties not only *save steel*, but also provide unusually high bearing values and exceptional lateral stability. So it's not uncommon to meet load-bearing requirements with less driving . . . or even *fewer* piles. And, because Monotubes are readily extendible on the job, with easy cut-off and simplified weld-splicing, further materials conservation is afforded.

### TIME AND MONEY SAVED

You can see how materials are saved

—*plus* time and money. And there are *more* economies! Monotubes' taper-flute design results in faster driving. Lighter, standard driving equipment can be used on most jobs. And, Monotubes' light weight makes handling and locating faster and easier.

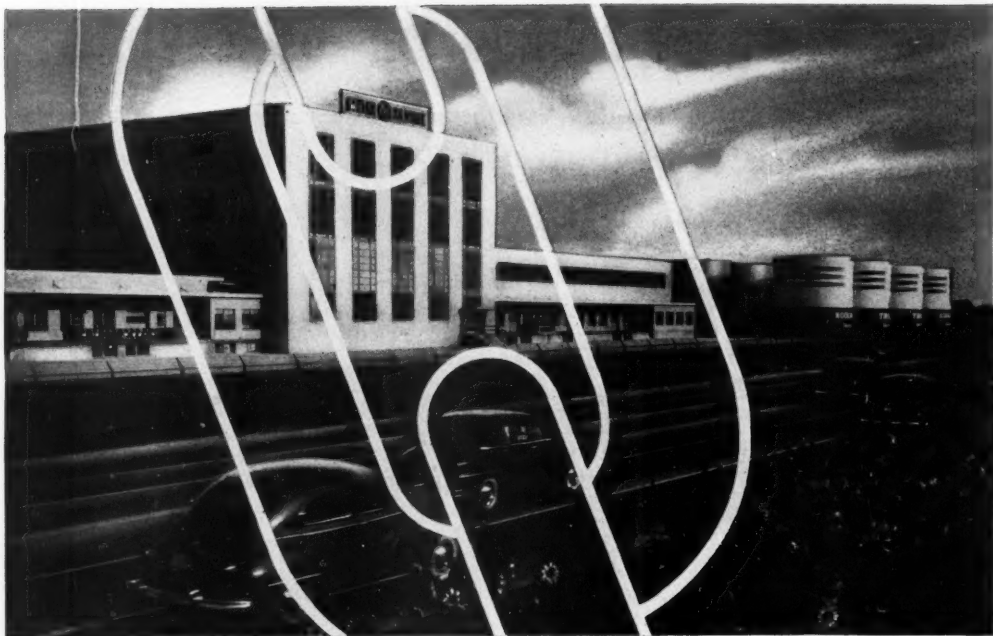
### GET COMPLETE INFORMATION

Send for all the interesting facts about Monotubes. Find out how their many advantages can help you save right at the start of your construction projects. For complete data, write The Union Metal Manufacturing Company, Canton 5, O.



## UNION METAL

*Monotube Foundation Piles*



*Cities Service Terminal & Compounding plant,  
Chicago, Illinois*

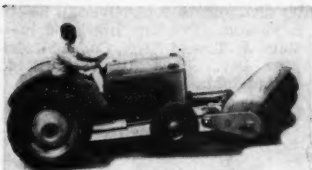
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Month by month you see the proof piling up of still more Cities Service growth... strength... progressiveness. Now the latest Cities Service facilities have been added in Chicago's Cicero district. Here a completely modern 25-million-gallon plant is in full operation today, to serve you with lubricants of characteristic Cities Service quality.

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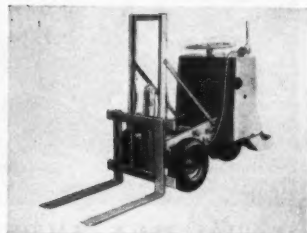




**TRACTOR-MOUNTED SWEEPER**—Broom-sweeper attachment can be attached or removed within 30 min. All shafts are heavy-duty and turn on ball bearings. Finger-tip power hydraulic control raises the broom 8 in. Broom tilts to adjust to surface. Broom is driven by rear power take-off at fixed ratio to engine speed. It sweeps a 5-ft swath at a 30-deg angle. Fiber or steel brushes are available.—Meili-Blumberg Corp., New Holstein, Wis.



**PORTABLE HAND LAMP**—Big Beam lamp No. 700-A throws a 2,000-ft light beam. Power is supplied by four standard No. 6 dry-cell batteries. The container has a waterproof base. The 6-in. adjustable lamp head has a silvered parabolic reflector. Two-way toggle switch controls the pre-focused main and auxiliary bulbs for bright and dim light.—U-C Lite Mfg. Co., 1050 W. Hubbard St., Chicago 22, Ill.



**FORK-LIFT ATTACHMENT**—Attachment for Moto-Bug powered wheelbarrow is a power-driven fork lift. It has a 1,000-lb lift capacity and raises loads to a height of 30 in. Forks tilt to the rear when being raised and are adjustable to a maximum width of 33 in. Standard forks are 20 in. long; 30-in. forks are optional. Total weight of the Moto-Bug with fork-lift attachment is 1,400 lb.—Kwik-Mix Co., Subs. of Koehring Co., Port Washington, Wis.

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Rapid Bucket Opening—  
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at every bite"*

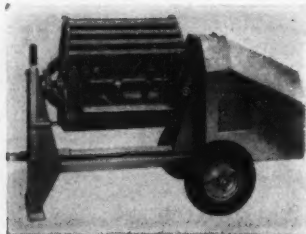
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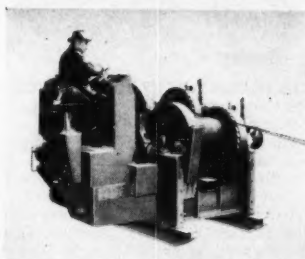


**PLASTER, MORTAR MIXER**—Mixer ½-bag plaster and mortar mixer has a 3-ft capacity. Over-all width of the No. 3 mixer is 29½ in; weight is 535 lb. without engine. Charging height of 36¼ in. and

hinged protective grid permit safe charging without stopping the machine. Drum can be tipped past discharge position, permitting hosing out and thorough cleaning. Replaceable blade and hoe assemblies are bolted to the mixing shaft. Power can be supplied by gasoline engine or electric motor.—**The Knickerbocker Co.**, 661 Liberty St., Jackson, Mich.

**DIESEL-POWERED FORK LIFT**—Diesel fork lift truck features a hydraulic transmission. It is powered by a Hercules 6-cyl diesel with a continuous rating of 70-hp. Power is transmitted through a double-impeller fluid coupling. Long-wheel base (72 in.) and wide wheel tread

provide stability and mobility. Chassis clearance is 9 in. Over-all height is 88½ in. Primary lift is 66 in.—**Yale & Towne Mfg. Co.**, Philadelphia Div., 11000 Roosevelt Blvd., Philadelphia 15, Pa.



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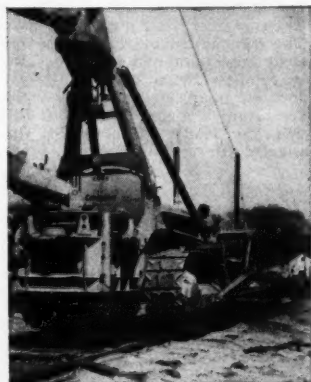
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**SPECIAL TRACK-WALKING SHOES**—Esco shoes for crawler tractors have flanges corresponding to flanges on railroad-car wheels. They enable the tractor to run on standard-gage railroad tracks for track laying, roadbed grading, car spotting, loading, or unloading. The tractor can mount or dismount without injury to the rails. Off the rails, the Esco shoes do not affect normal tractor performance.—**Electric Steel Foundry Co.**, 21241 N. W. 25th Ave., Portland 10, Ore.

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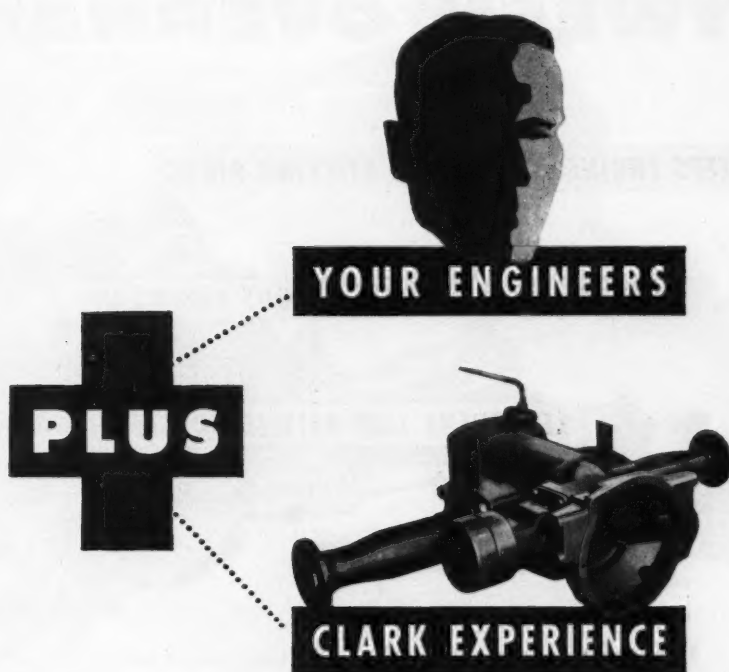
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**LENGTHENS TIME BETWEEN OVERHAULS**

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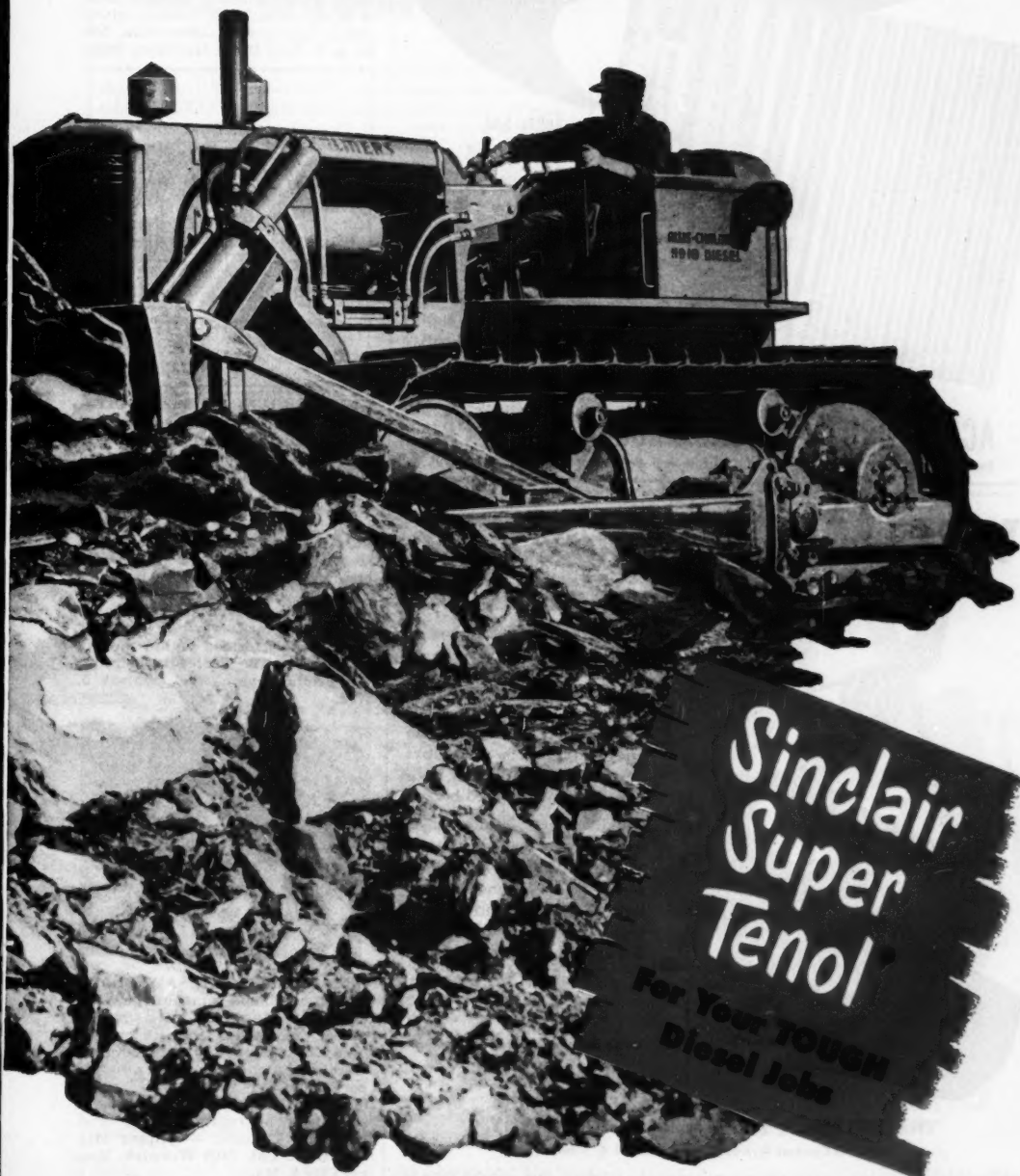
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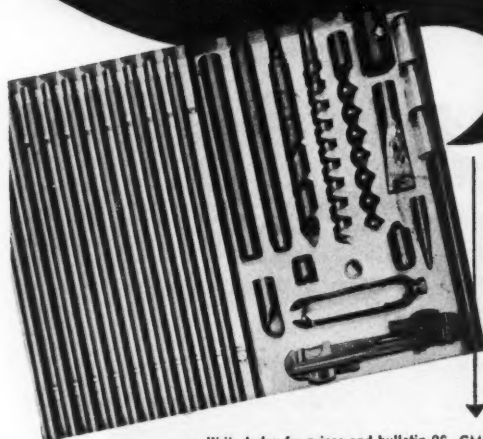
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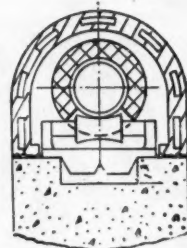
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**UNDERGROUND PIPE CONDUIT**—

U-Tile conduit is designed for one-pipe installations, or for installations having several small pipes. They are shipped as flattened cylinders scored longitudinally on both of the flattened sides. Tapping over each scoring with a hammer splits the cylinders into two "U" tiles. (A half is shown in the illustration.) A circumferential scoring at one end of each tile when chipped off provides a rough-edged bevel that permits the jointing mortar to key and bond into the channels formed within the tile sections. — **The Porter-Hayden Co.**, 825 Frelinghuysen Ave., Newark 5, N. J.



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Most construction and mining men are familiar with the famous X-71 WD Rock Drill. Its drilling speed and hole cleaning ability on deep holes are recognized wherever Wagon Drills are used. It is the only drill made especially for Wagon Drill service.

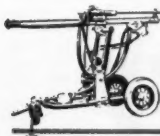
To permit even further utilization of the power and reliability of this drill, we introduce a brand new mounting known as the FM-3. It incorporates a new type of lifting mechanism and a rugged yoke that permits easy drilling in any position encountered in modern rock excavation.



Notice how the swivel wheels are turned and how the drill extends beyond wheels for line hole work against a face.



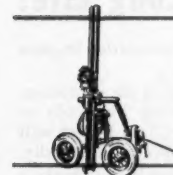
And how low the yoke can be lowered for efficient toe hole drilling.



Or how, by a handy crank actuating a powerful worm gear arrangement, the yoke and drill can be easily raised to highest drilling position.



Here's an exceptionally stable and easily moved set up for drilling hole after hole along a face.



What could be more convenient for line hole work? It takes but a minute to swing the swivel mounted wheels through a 90 degree angle.



And for steeper angle drilling, here's another easy set up. All controls are at the operator's fingertips.



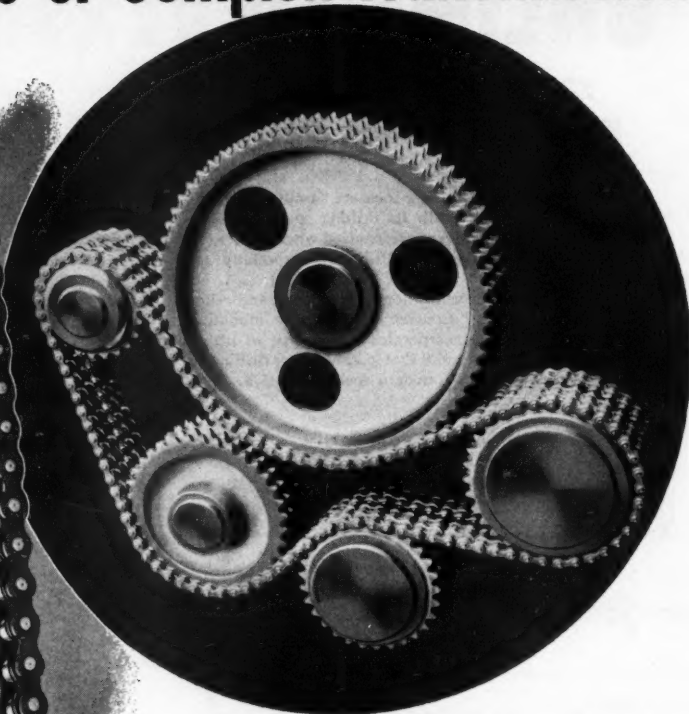
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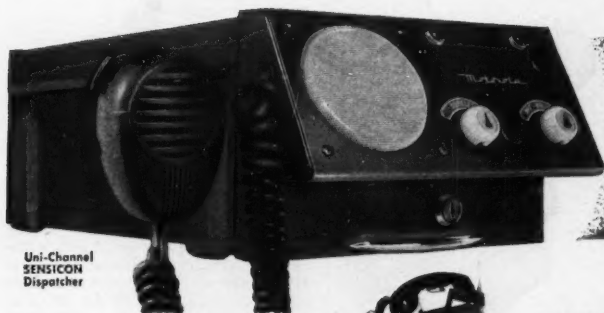
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Dispatcher

HANDIE-TALKIE\* Portable



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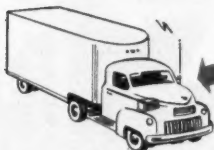
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Set it on your desk, plug it into a socket, connect antenna, and you're in business with instant communication to all your mobile units.



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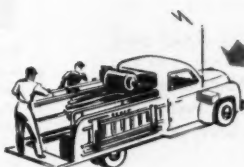
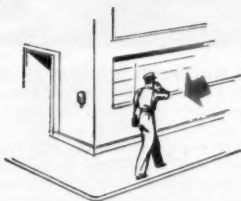


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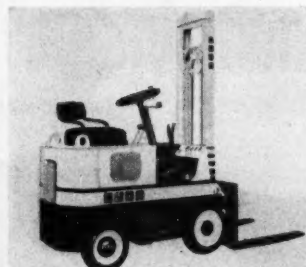
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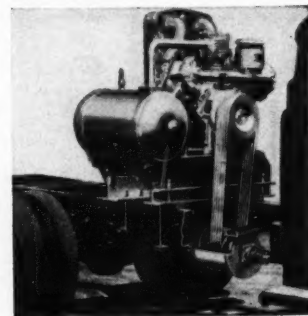
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San Francisco 7  
Portland 9  
Seattle 4



**FORK - LIFT TRUCK** — Shorter length, shorter width, and narrower turning radius are features of this 2,000-lb-capacity fork-lift truck. The FB20 is available with a 24- or 15-in. load center. The 9¼-in.-dia clutch is easily replaceable in 30 min without removing transmission. The FB20's are available with standard masts having lifts of 72, 84, 108, 114, and 120 in.—The Buda Co., Harvey, Ill.

**LUBRICATED PLUG VALVES**—Worm and gear-operated Homestead-Reiser valves (Figure 502 GW) feature Self-Seald construction and port area equivalent to 100% of the area of standard pipe. Cast in semi-steel, they are made in 8-, 10-, and 12-in. sizes. They will also be available in a cast-steel full-port type (Figure 562 GW), and in venturi types sizes up to 14 in.—Homestead Valve Mfg. Co., P. O. Box 550, Coraopolis, Pa.



**TRUCK-MOUNTED COMPRESSOR**—Model 125 compressor is now available for truck mounting and truck engine drive. The unit mounts on any of five popular makes of 1½- and 2-ton-rated trucks; adapts to special body designs; and derives power from the truck engine through a simple power take-off. Compressor is a Jaeger New Standard model, furnishing 125 cfm of 100-lb air. It is capable of driving two heavy-duty or three medium-duty pavement breakers at full 90-pressure at the tools. Two levers in the truck cab control all functions. Compressing speed is 1,750 rpm (approximately 24 mph on the speedometer).—The Jaeger Machine Co., 800 Dublin Ave., Columbus 16, Ohio.



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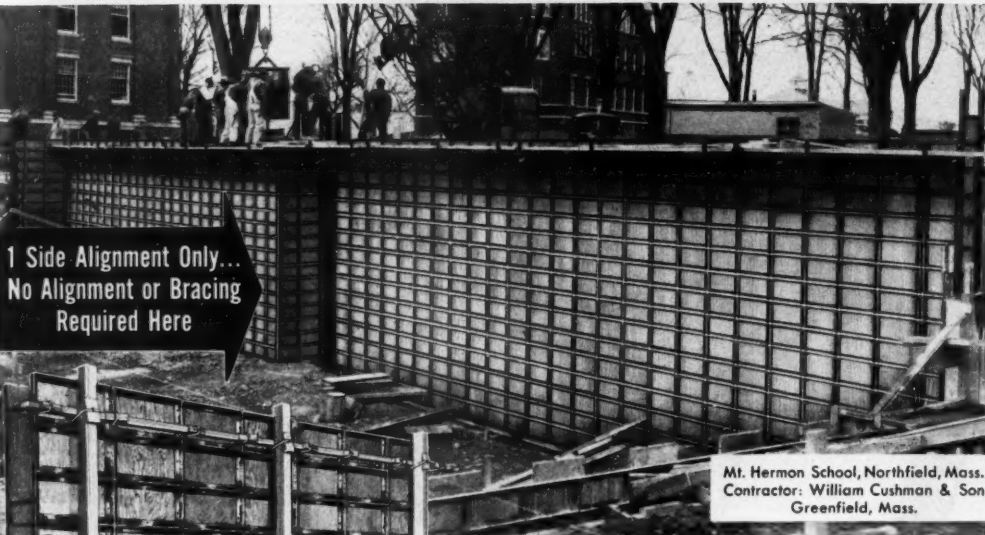
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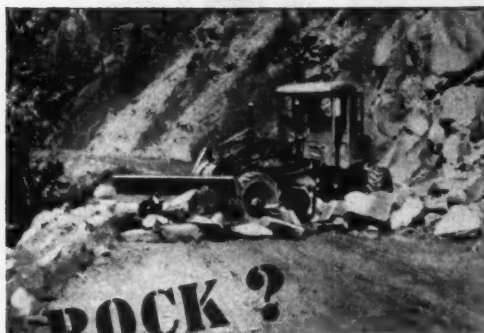
- SAN LEANDRO, CAL., 2051-9 Williams St.
- DALLAS, TEXAS, 3310 Ramsey St.
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On an A-W Power Grader the bulldozer becomes a rough, tough tool . . . extra sturdy to match the extra power of ALL-WHEEL DRIVE, and fully up to this job of clearing a rock slide.



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Live, climbing power at both ends of the machine keeps it bulldozing steadily through sand where an ordinary grader would find it difficult to travel, let alone work.



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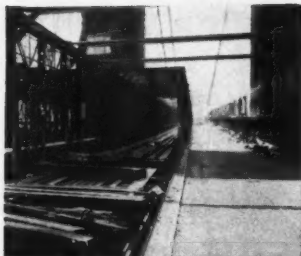
The traction and maneuverability of A-W Power Graders make them ideal tools for the Bulldozing jobs found on grading and construction work. Heavily made and reinforced to accommodate the extra power of All-Wheel Drive and Steer, the Bulldozer is an essential for many jobs — a time and money-saver for dozens of others.

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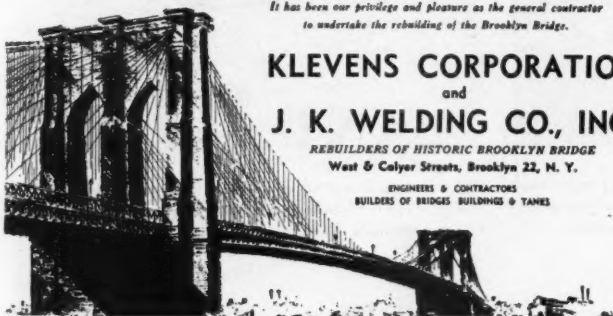
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### J. K. WELDING CO., INC.

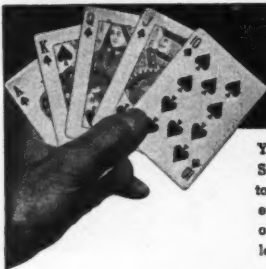
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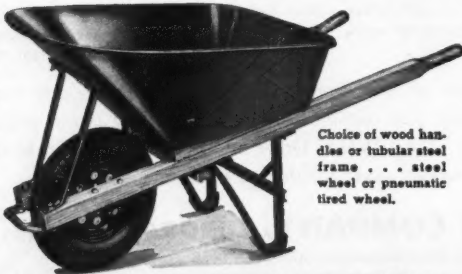
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You're sure to win with these easy-wheeling Sterling barrows. Why? Because Sterlings are made to outlast any barrow on the market. Sterlings are engineered and built to take hard punishment over a long period of years. That's why they cost less. Get the facts. Write for Catalog No. 81.

#### STERLING C5W

Maximum capacity 5 cu. ft. 16 gauge tray, all-welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.



Choice of wood handles or tubular steel frame . . . steel wheel or pneumatic tired wheel.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

# Sterling

## WHEELBARROWS



Look for this Mark of  
STERLING Quality

## New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

**PIPE-MACHINE GUIDE**—Operating guide provides information on how to achieve the best results from portable pipe and bolt machines and hand pipe tools. This 4-p folder features simple pen-and-ink drawings and copy designed to tell quickly how to locate and correct troubles. It covers 31 different operations including: Correct use of threading oil; what to do about dies that are dull, chipped, or have developed stickers; how to check dies for proper rotation; how to overcome flat-sided threads; what to do about special thread, threads that are not standard, and threads that lack proper taper. Other data cover cutting; how to use driven geared tools; reaming; operation of oil pump; electrical data; and care of dies.—**Beaver Pipe Tools, Inc., 334 Dana Ave., Warren, Ohio.**

**TENSION LOAD CELL**—Bulletin 325 describes the SR-4 Type P tension load cells which are based on SR-4 bonded resistance wire strain gages for load measurement. The 2-p bulletin illustrates and gives specifications for load cells of four capacities between 10,000 and 100,000 lb.—**Baldwin-Lima-Hamilton Corp., Testing Equipment Dept., Philadelphia 42, Pa.**

**TORQUE CONVERTERS**—Principle of operation of torque converters is fully explained in *Production Road*, a publication of the Twin Disc Clutch Co. The discussion is amplified by illustrative drawings and photographs of component parts.—**Twin Disc Clutch Co., Racine, Wis.**

**INSULATED RECORD FILES**—Folder 180-010 presents four models of 3- and 4-drawer letter files and features a description of the various endurance, explosion, and impact tests to which these files have been subjected. Dimensions and features of construction are listed prominently.—**Herring-Hall-Marvin Safe Co., Hamilton, Ohio.**

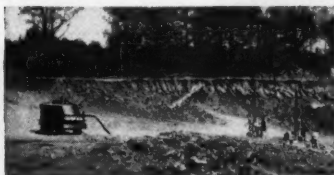
**TRACTOR EQUIPMENT**—Catalog 1106 covers the complete Trackson line of equipment for Caterpillar diesel tractors. Products described and illustrated include the Trac excavators, pipe layers, earth augers, TracLoaders, swing cranes, and land-clearing equipment. Specifications are included for each unit.—**Trackson Co., Dept. F, Box 728, Milwaukee 1, Wis.**



# GM DIESEL powers world's most compact 600 cfm Compressor



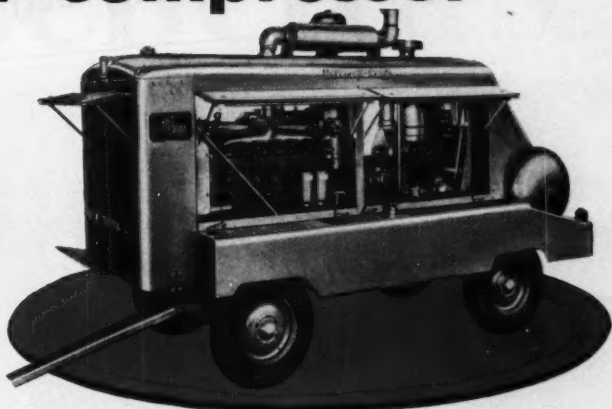
**CONSTRUCTION**—"Starts like a charm, even on the coldest morning. No time wasted in getting up to pressure. Runs a heavy pile driver with ease. We can set it out of the way with a crane and move it back to the roadway for towing in no time."



**QUARRYING AND MINING**—"We couldn't imagine 600 feet coming from such a slick little compressor until we saw the increased drill footage, and the ease with which it took over two FM-2 wagon drills. Good fuel economy, too."



**HIGHWAY BUILDING**—"Plenty of reserve—full capacity at 6,730 feet altitude. We're operating eight 55-lb. blower drills putting in 20-ft. holes on cliffsides. So easy to maneuver and work with that it's a natural for tough jobs like this."



**WINNING** acclaim as the world's smallest, lightest, big-capacity portable compressor, the new Ingersoll-Rand Gyro-Flow 600 is powered by a 6-cylinder General Motors Series 71 Diesel engine.

This compact, high-powered portable delivers a full 600 cubic feet of air per minute at a steady 100-lb. pressure, yet it weighs only 9,500 pounds. It is 20 to 40% lighter—and as much as 20% smaller—than other portables of comparable capacity.

Being 2-cycle, GM Diesel engines pack more power in less space. They start quickly on their own fuel, run smoothly and enable equipment to maintain rated performance at high altitudes. They're designed for ease of maintenance—no high-pressure fuel tubing—unit injectors that can be changed in a matter of minutes. And, when needed, low-cost "Factory-Engineered" parts are readily obtainable.

These modern 2-cycle Diesels are bringing new economy and efficiency to more than 500 different kinds of power equipment built by 120 manufacturers. Ask your GM Diesel distributor or write us for full details.

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THE CALL  
CIVIL DEFENSE

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SINGLE ENGINES... Up to 275 H.P. DETROIT 28, MICHIGAN MULTIPLE UNITS... Up to 800 H.P.

GENERAL MOTORS

**DIESEL BRAUN WITHOUT THE BULK**



Where two important State Highways become one...

... the pavement Rhode Island laid was  
heavy-duty Sheet Asphalt



Constructing a 3-inch Texaco Sheet Asphalt pavement for the heavy traffic of Reservoir Avenue, Cranston, R.I. Contractor: The Campanella and Cardi Construction Company of Providence.



Two of Rhode Island's principal north-south highways are its Routes 2 and 3. South of the city of Cranston, these highways come together, sending their combined traffic over this municipality's Reservoir Avenue.

This year, the State of Rhode Island is widening a substantial portion of Reservoir Avenue to six lanes, then paving it with 114,000 square yards of Texaco Sheet Asphalt. Laid in two courses, in this case a 1½-inch binder course and a 1½-inch wearing surface, this dense, resilient type of pavement successfully absorbs punishing traffic impact year after year, with a low maintenance cost. This

has been demonstrated by the performance of many million square yards of Sheet Asphalt under the heaviest kind of traffic.

The 60-70 penetration asphalt used on Reservoir Avenue, like all other Texaco asphalts, is a product of carefully selected crudes. Into its refining goes the know-how gained through supplying asphalt to America's road builders for 45 years.

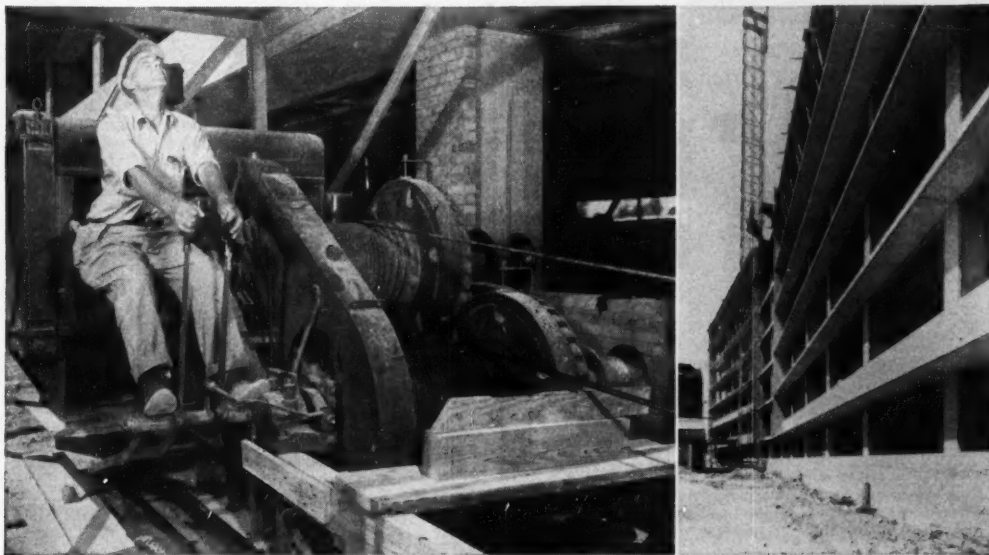
*A helpful booklet about Sheet Asphalt and other heavy-duty asphalt pavements of the plant-mix type may be obtained without charge or obligation by writing our nearest office.*



THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17  
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

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**S**OMETIME this spring, the 15,000th trip will be made by a pair of one-yard concrete buckets . . . and pouring will be completed on the State of Michigan's new 10-story Northville mental hospital, near Detroit.

O. W. Burke Co. of Detroit, general contractors on this job, wanted absolute assurance of steady,

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This \$6,500,000 project is moving smoothly toward on-schedule completion. For such jobs—or \$6500 jobs—or \$65,000,000 jobs—you cannot make a safer choice than American hoisting power!

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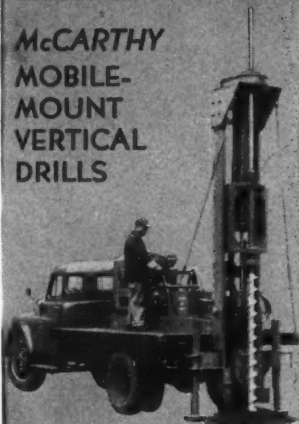
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• You're set to drill all ordinary rock formations when you're equipped with mobile-mounted McCarthy Vertical Drills. These heavy, rugged McCarthy units are compactly designed for truck, half-track, cat or "Jumbo" mountings. They're easy to move about, easy to set up. They're equipped with finger-tip hydraulic controls; your choice of electric, diesel or gasoline power units.

Recently, on one difficult job, workers using McCarthy equipment drilled an 8-inch hole 100 feet deep in only 40 minutes!

Write today for full facts about McCarthy Drills. See for yourself how you save valuable time on the job by using a McCarthy—the toughest, latest, most efficient unit ever made.

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SINCE 1901**



**THE SALEM TOOL CO.**  
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SALEM, OHIO, U. S. A.

## SCHOOL SOUND-CONDITIONING

—Brochure covers the general subject of noise control in schools. It also lists the particular sound problems of specific areas. Illustrations show various types of Acousti-Celotex products featuring a description of the various decorative effects possible with these materials.—**The Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill.**

## TRUCKS IN CONSTRUCTION—

Part played in construction by heavy-duty trucks and highway tractors is described by pictures and text in this 6-p folder. Advantages of these units in hauling stone, ready-mixed concrete, brick, steel, lumber,

and machinery are cited. Many different types of units are illustrated listing the various body styles and chassis available for a wide range of operations.—**The Autocar Co., Ardmore, Pa.**

## DIESEL CRAWLER TRACTORS—

Detailed specifications on the TD-9 diesel crawler tractor are included in this two-color catalog. Featured is a description of how the TD-9 develops and applies its 40.5 drawbar hp. Several varied job application scenes appear in Catalog CR-313-A along with information on construction and operating features.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**



## there's a hook in it

If every mixer manufacturer tried to "popularize" a different series of drum sizes, estimating would be anybody's guess.

That's why the construction industry established uniform sizes and rigid requirements for mixers and pavers, which have been changed only where experience proved new sizes would serve better.

Whether you are a contractor, architect or engineer, the AGC Rating Plate is your protection. Look for it on the mixer you buy or the mixer that pours your jobs.



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Affiliated with the Associated General Contractors of America, Inc.

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**THE KNICKERBOCKER CO.**  
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**KOENRIG COMPANY**  
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**KWIK-MIX COMPANY**  
Port Washington, Wis.

**THE T. L. SMITH COMPANY**  
Milwaukee, Wis.

**WORTHINGTON PUMP AND MACHINERY CORP.**  
Construction Equip. Div., Dunellen, N. J.





**MASTIC APPLICATIONS** — Mastic calking and pointing in masonry construction are described in this 12-p brochure. Illustrated by photographs and drawings, the bulletin contains a complete discussion of the subject. The specifications, indexed for handy reference, cover calking, pointing, bedding, and buttering.—**The Tremco Mfg. Co., 8701 Kinsman Road, Cleveland, Ohio.**

**SEWER FAILURES** — Bulletin entitled "Help Prevent Sewer Failures Before They Happen" shows how Armco corrugated metal sewer structures help avoid sewer failures. Inspection reports on Armco structures are a feature of the bulletin. Specifications and installation data are listed, as are pointers on how to repair failing sewers.—**Armco Drainage & Metal Products, Inc., Middletown, Ohio.**

**PORTABLE ROLLER**—Catalog 350 presents data on the Gallion portable roller. Complete specifications are listed, together with detailed descriptions and photos of many construction and operation features. These include: Hydraulic steering, constant-mesh transmission, spur-gear final drive, variable-weight compression roll, and towing hitch with built-in hydraulic jack.—**The Gallion Iron Works & Mfg. Co., Gallion, Ohio.**

**SWIMMING POOLS**—Manual contains 12 pp of information on steel swimming pools. It discusses the advantages of the Koven pools and gives full design, construction, and erection details. Each design feature is illustrated by appropriate drawings or sketches.—**Koven Steel Swimming Pools, Inc., 155 Ogden Ave., Jersey City, N. J.**

**UNDERGROUND PIPE CONDUIT**—Therm-O-Tile conduit is fully described in this 8-pager. Therm-O-Tile is a complete conduit system for the permanent protection, support, and insulation of underground pipe lines, hot or cold. Bulletin 511 illustrates the features and advantages of this system.—**H. W. Porter & Co., Inc.-Reid Hayden, Inc., 825 Frelinghuysen Ave., Newark 5, N. J.**

**DIRECT-FLOW PUMP**—Data sheet 64-a (6 pp) describes the Aldrich 3-in. stroke direct-flow Triplex pump. It illustrates and presents features of design, construction, dimension drawings, and performance data. Recommended applications are listed.—**The Aldrich Pump Co., Allentown, Pa.**

**FIRE EXTINGUISHER GUIDE** — General line folder covers a complete line of portable and special-purpose fire extinguishers. A handy chart provides an easy-to-use guide for selecting the right extinguisher for every type of fire hazard.—**Stop-Fire, Inc., 125 Ashland Place, Brooklyn 1, N. Y.**

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### **J-M INDUSTRIAL FRICTION MATERIALS**

are designed to take a beating—that's why they're specified by manufacturers who build earth-moving equipment that lasts!



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Men who operate bulldozers—cats—shovels—know they can get the tough jobs done when they're running machines equipped with **J-M INDUSTRIAL FRICTION MATERIALS**

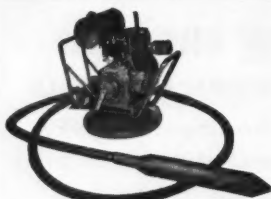
• Digging a canal—stripping a mine—cutting a road—Johns-Manville Friction Materials move more tons of earth than any other industrial brake or clutch frictions. That's because they've built a reputation for handling bigger loads at high speeds—*at lower cost!* Send for your copy of "Johns-Manville Industrial Friction Materials" that tells how these materials combine maximum operational efficiency with long life and low-cost maintenance. Write Johns-Manville, New York 16, N. Y.



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## Concrete VIBRATORS

Gasoline Engine or  
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Portable — Stationary  
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## BLADES AND CUTTING EDGES of Superior Quality by Shunk

For all makes and  
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chines. Also —

**BULLDOZER BLADES**  
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**REMOVAL BLADES**  
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All widths, lengths,  
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accurately punched  
to fit your make of  
machine.

Write for bulletins  
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**STUD WELDING**—Booklet 451 shows fundamental operating principles of the stud-welding process and typical application of it. It features a description of how stud welding can be used to eliminate drilling, tapping, and hand-welding. Complete information is listed for KSM studs and stud-welding equipment.—**KSM Products, Inc., Merchantville 8, N. J.**

**WROUGHT IRON PIPE**—Data on wrought iron pipe is contained in 4-p Bulletin 27a/By. Consolidated tables list size and dimensional data for standard and extra strong pipe. These tables contain complete information on threads per inch, mill test pressures, circumference, external areas, length per sq ft of

surface area, length per cu ft of volume, gal per lineal foot, and weight of water per lineal ft. Also included is a radiant-heating conversion chart and a formula for use in designing snow-melting systems.—**A. M. Byers Co., Engineering Service Dept., Clark Blvd., Pittsburgh, Pa.**

**THE STORY OF KAYLO**—Kaylo calcium silicate products and their various uses are described in a new 24-p booklet. It serves to acquaint potential users with Kaylo and its various applications. First half of the booklet is devoted to research and development history of this hydrous calcium silicate product and a description of its properties.—**Owens-Illinois Glass Co., Toledo 1, Ohio.**

# 4940 PILES DRIVEN without a hitch!

McKiernan-Terry Hammer driving the first concrete pile at the Terminal de Posojeros in La Guaira, Venezuela. Frederick Snare Corporation, Contractors.



Four McKiernan-Terry Type S-8 Single-Acting Pile Hammers were used to drive 4940 concrete and steel piles on this important project . . . making a typically perfect McKiernan-Terry record • Three of the hammers drove a total of 4000 18-inch square concrete piles, of 57-ft. average length. A fourth S-8 hammer drove 940 14-inch steel H-piles averaging 53-ft. in length • The report on this job states: "Performance of these hammers was excellent. Piles were driven to 63 tons bearing capacity, no mechanical difficulties were ever experienced with any of the hammers, and no repair parts had to be ordered." • Upon completion of the job, all four McKiernan-Terry Hammers were still in excellent condition • This performance record illustrates why so many contractors choose McKiernan-Terry Pile Hammers for speedy, accurate and economical pile driving. 11 Double-acting hammers, 5 single-acting hammers and 2 extractors are available in the complete McKiernan-Terry line • Write for bulletin giving full data.



GRAB BUCKETS



COAL TOWERS



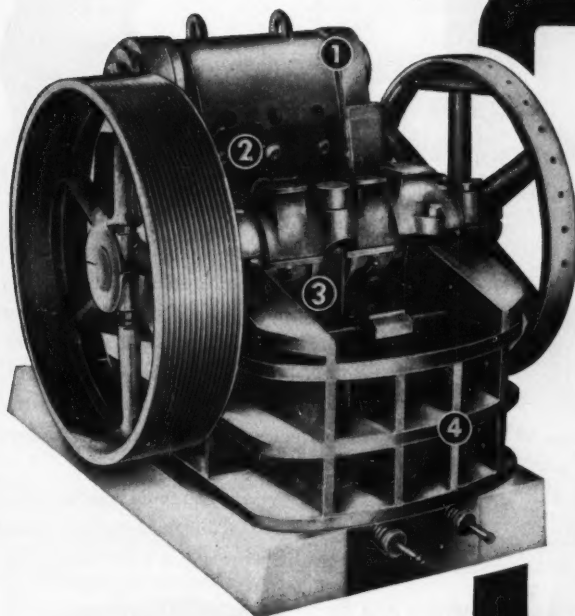
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ME-383

# Four construction features make A Traylor HB Jaw Crusher *best* for on-the-job aggregate production



**SWING JAW SHAFT** is locked securely in both sides of the frame. Swing jaw works freely with less wear. This patented Traylor construction reinforces frame and reduces maintenance.

**CURVED JAW PLATES**, outwear conventional straight plates 3 to 1 . . . produce greater tonnages of a finer, more uniform, product with less power.

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**REINFORCED, WELDED STEEL PLATE FRAME** for exceptional strength without excessive weight. This facilitates transportation, handling and erection.

The Traylor HB Jaw Crusher has established enviable records for economical primary crushing of a wide variety of materials. In its wide range of sizes, up to 56" x 72", you will find a Traylor HB that is ideally suited to your primary crushing requirements. Get complete details on this advanced primary breaker by mailing the coupon today.

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Rotary Kilns, Coolers and Dryers • Grinding Mills  
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Please send me full information that shows how the HB Jaw Crusher can reduce my operating costs.

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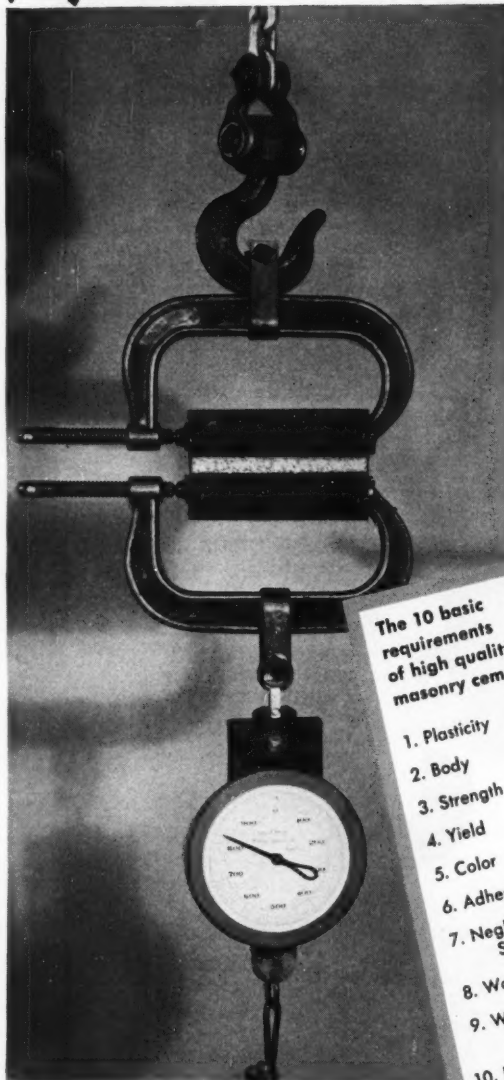
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Illinois Local No. 21,  
a bricklayer since 1917



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"Everything you could want in a masonry cement you'll find in Marquette. It's better masonry cement in every way."

#### The 10 basic requirements of high quality masonry cement\*

1. Plasticity
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\*You get all 10 when you use Marquette!

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PORTLAND • HIGH EARLY STRENGTH • AIR ENTRAINING • MASONRY

Any quantity of Marquette Masonry Cement will be shipped in mixed carloads with other types of Marquette Cement



**HOLE-SAVER**—Rock Bit Hole-Saver is described in a 4-p pamphlet. This pamphlet features a section drawing showing how this outside fishing sleeve is force threaded in a left-hand direction on to the broken end of lost steel.—**Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa.**

**BUCKET LOADERS** — Bulletin H 75-77 describes the Models 75, 77, and 75 SBC bucket loaders. These loaders have a capacity of 3 yd per min. Contains schematic drawings indicating various dimensions of each of the three models. One page is devoted to a complete listing of all general specifications. Photographs

show typical applications.—**George Haiss Mfg. Co., Inc., Div. of Pettibone-Mulliken Corp., 141st St. and Park Ave., New York 51, N. Y.**

**BATTERY SERVICE**—Bulletin 194 describes features of AD-X2, a chemical compound designed to decrease sulfation and increase life of storage batteries. The bulletin consists mainly of reprints from "The Battery Man" and briefly describes the development of AD-X2 and the tests to which it has been subjected. It contains detailed "how-to" instructions for servicing lead-acid batteries and reprocessing junk batteries.—**Pioneers, Inc., 2411 Grove St., Oakland 12, Calif.**

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A STANDARD STEEL  
PRESSURE DISTRIBUTOR  
GIVES EQUAL CIRCULATION THROUGHOUT  
THE SPRAY BAR FOR A  
UNIFORM SURFACE  
FROM CURB TO CURB  
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The Model 424 can be loaded in quick time for a "fast get-away". A two-way cleaning system guarantees a clean spray bar at the end of the day. First, the material is sucked out of the bar and back into the tank. Then by turning one small valve, cleaning solvent is released into pump and spray bar (without contaminating the asphalt in the tank). No time lost in tinkering—no time lost in loading—Standard Steel 424 keeps going all day long far ahead of the "gravel gang".

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Standard Steel Works NORTH KANSAS CITY, MO

**More work**

**Less cost**

**with foolproof  
RUD-O-MATIC**

**TAGLINE  
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**HERE'S WHY:**

You get *more work* out of a bucket that holds steady and is back in position *quicker* for another bite. Rud-O-Matic Taglines have ample coil spring power to provide constant tension for steadying the largest clamshell buckets at any angle of the boom.

You get *lower costs* through faster operation coupled with Rud-O-Matic's trouble-free service. No pins, weights or tracks to get out of whack, only the simplest of working parts. Compact — and easy to install on any crane.

Rud-O-Matic Taglines are made in 8 models for all bucket sizes, and are supplied with cable and installation equipment. *Immediate delivery from your nearby equipment dealer — or send coupon below for details.*



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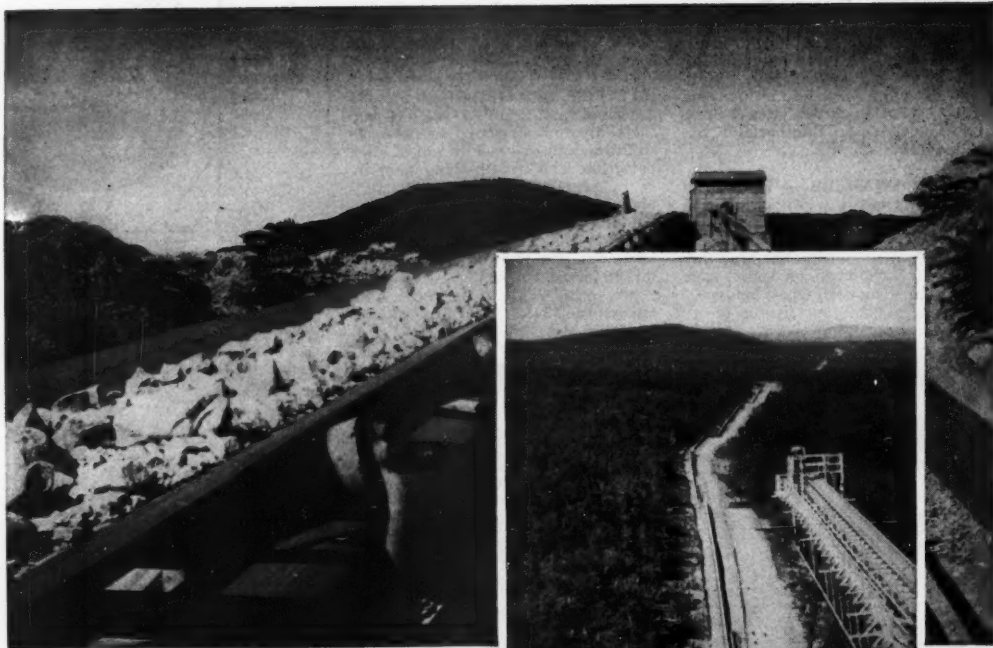
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## ROAD BED... NEW STYLE!

Here's the latest style in "road beds" to carry construction materials from their source to the job!

This road bed—a Hewitt-Robins Belt Conveyor—will transport those materials far more efficiently, more economically. For, with a Hewitt-Robins Belt Conveyor, no roads need be built (except for maintenance). No tracks need be laid. No expensive trucks need be bought, manned or maintained.

Grades can be mastered. Rivers, roads, and valleys can be bridged.

When tunnels are inevitable, you provide a passage, not a highway!

Sound interesting? Then let's talk facts and figures. Send us the details of any project you have now, or intend to bid on. Include topographical maps. We will show you how conveyerizing may be more efficient, more dependable, more economical... a way to get jobs, a way to make more money on the jobs you do get. Write Contractor Service Department, Robins Conveyors Division, 270 Passaic Avenue, Passaic, N. J.

As originators of the modern belt conveyor, Hewitt-Robins makes *all* types—Hewitt-Robins alone makes *all the parts*... machinery and belt. And *only* Hewitt-Robins is able and willing to take complete, unified responsibility for design, installation and successful operation!

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**Are you satisfied with your present hand labor costs? If you're like most construction men, your answer is probably an emphatic "NO"!**

**Hand labor is expensive—because it's slow.**

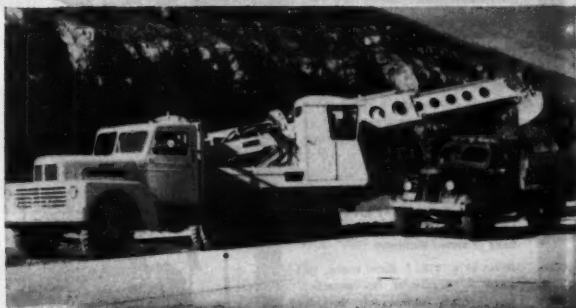
But that's *not* the situation when you put a Gradall on the job!

The operator works with large tools, quickly changed for each particular job. He moves large quantities of earth rapidly, with such precision that clean-up hand labor is practically eliminated.

And the Gradall works in "tight" places inaccessible to other machines. Mounted on a 360° turntable, its telescoping boom "reaches out", twists and turns like an arm, to do its work in confining areas not much larger than the Gradall itself. And it's always "ready to go"—ready immediately to be driven to the next job at truck speed.

Cut your construction costs on many jobs, such as trenching, excavating, ditching, backfilling, grading, and pavement removal. Arrange a field demonstration with your Gradall Distributor today.

**Gradall Distributors in over 60 principal cities  
in the United States and Canada**



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**WORLD'S FOREMOST  
"SHAKE-DOWN ARTIST"**

**GETS  
Greater Soil  
Compaction**

**IN TWO PASSES—THAN  
25 TON ROLLER  
ATTAINS IN EIGHT!**

The Vibro-Plus Vibratory Soil Compactor Type MRJ-6. It weighs only 1.6 tons. Vibrating 950 times per minute, it effectively compacts up to 2,000 sq. ft. per hour under its own power, penetrating as deeply as 40 inches. Towed by tractor, it accomplishes about four times more work.

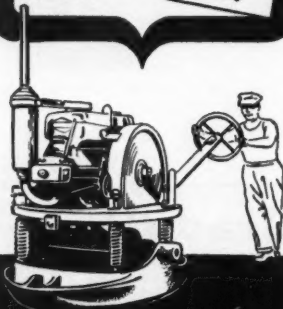
Useful where larger equipment can't go—on open areas, too, it convincingly outperforms other equipment—achieving up to 97.2% of absolute compaction in only 2 passes, compared to 94.2% in 8 passes with a 25-ton rubber-tired roller; 95.4% in 6 passes with an ordinary 12-ton roller; 96.2% in 6 passes with a 7-ton vibratory roller.

You easily can figure how this favorably-priced Vibro-Plus equipment will save impressive amounts of time and money on your jobs. Write for complete facts and name of nearest distributor.

Driven by a 10 H. P. diesel engine, the MRJ-6 is recommended for compacting roads, railway embankments, backfills earth dams, airfields, soil under floors and foundations, etc.

One man can "walk" this Vibro-Plus Compactor or it can be towed by tractor. The 45" x 45-5/16" base is steered by turning the steering wheel. Rubber-tired wheels attach easily for transportation.

**VIBRO-PLUS**  
Soil Compactor  
—one of the  
complete line  
made by the  
pioneers in  
vibrating and  
compacting



**VIBRO-PLUS**  
PRODUCTS, INC.

54-11 QUEENS BOULEVARD  
WOODSIDE, L. I., NEW YORK

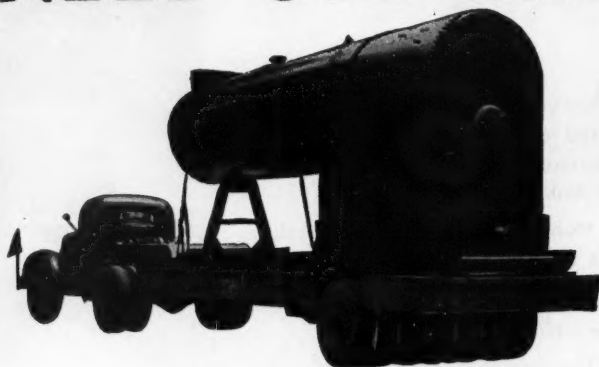
**REYNOLDS ALUMINUM** — Birth and growth of the Reynolds Metals Co. are outlined in this 48-pp book which features a description of the production of aluminum from bauxite, the characteristics of aluminum, the many forms in which it is made, and its various applications. More than 250 illustrations are used. Specialized aluminum products (powders, pastes, and chemical aluminas) are described.—**Reynolds Metals Co., 2500 S. 3rd St., Louisville, Ky.**

**FAN-COOLED MOTORS** — Bulletin describes types of construction and ratings of fan-cooled motors with tube-type air-to-air heat exchangers.

These are available in squirrel-cage, wound-rotor, and synchronous types for horizontal and vertical installations. Features listed include capsule-type bearings, protected air intakes, and pipe-plug protected tapped holes for checking air gap with feeler gages.—**Allis-Chalmers Mfg. Co., 840 S. 70th St., Milwaukee, Wis.**

**DRAINAGE PLUMBING PRODUCTS**—Catalog GS-2 is a ready reference guide listing a complete line of plumbing drainage products approved for use in government buildings and marine construction.—**Josam Mfg. Co., Dept. 310, 1302 Ontario St., Cleveland 13, Ohio.**

## NEED STEAM?



LUCEY 104 H.P. 150 and 250 lb. W.P.  
Skid mounted with 24" oil burning base.

## LUCEY Inside Seal-Weld Double Calked BOILERS

1. 1040 sq. ft. heating surface.
2. 160 cu. ft. furnace volume.
3. Ample steam volume 54 cubic feet.
4. Oversize seamless firebox.
5. Butt straps calked and seal welded inside.
6. Four-inch water space around firebox.
7. Boilers available from 40 to 150 H.P.  
Working Pressures from 125 to 350 lbs.

Write for descriptive literature.

# LUCEY

**BOILER and MANUFACTURING CORPORATION**

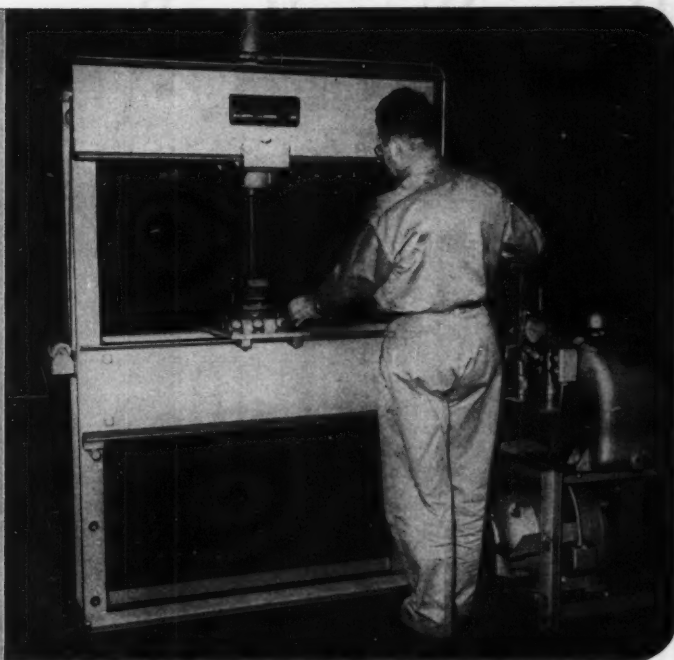
CHATTANOOGA, TENNESSEE

1514 CHESTNUT ST. CHATTANOOGA      1312 STERLING BLDG. HOUSTON, TEXAS

SMOKE STACKS
• BREECHINGS •
FLY ASH REMOVAL UNITS

ASME UNFIRED PRESSURE VESSELS





Above is a standard Rodgers 60 ton Shop Press with a Rodgers Power Pump. Other models have capacities of 80, 100, 150, 200, 300 and 400 tons.

## HERE'S *Rodgers Hydraulic* POWER ...to do 101 jobs faster, better, easier

You'll find a Rodgers Shop Press is the finest all-around time-and-labor-saving equipment you can have in your plant... for a multitude of pressing, forming, bending, straightening jobs... for die tryout... and even short production runs.

Their many exclusive features make Rodgers Shop Presses unusually versatile in performance... and there are several standard models and capacities to suit most every shop or plant requirement.

Other Rodgers Hydraulic Equipment is available too, for your special jobs.

### SEND FOR CATALOGS

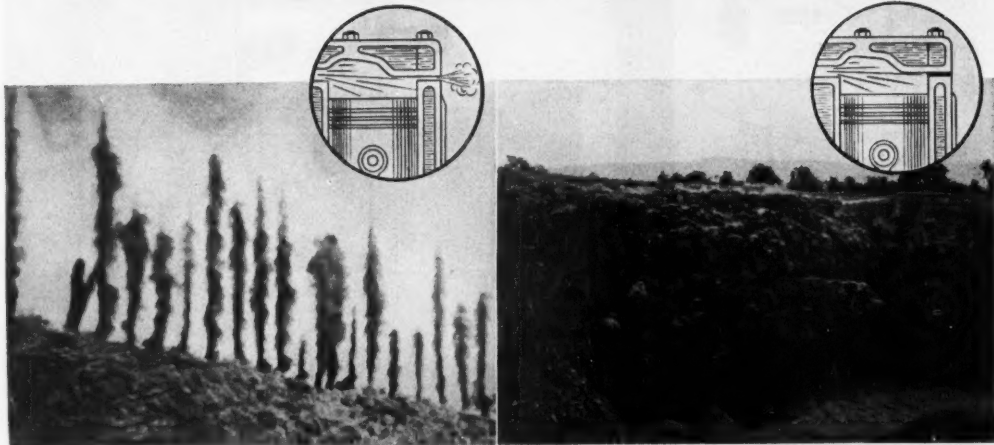
Complete details of Rodgers Equipment are covered in available catalogs. Write for them.



# Rodgers Hydraulic, Inc.

7403 WALKER ST., ST. LOUIS PARK, MINNEAPOLIS, MINN.

# Power Wasted!      Power Working!



*Like a "blown" gasket, an ordinary blast wastes the power that **ROCKMASTER** blasting keeps on the job!*

THE HAMMER, hiss, and whistle of a "blown" gasket means a lot of power is going to waste instead of working on the piston. In the same way, the objectionable noise that often comes from blasting usually means that explosives power is being wasted instead of working on the rock. And that wasted gas is often visible as "geysers" of smoke or wild flying rock.

ROCKMASTER blasting keeps blasting power—the explosives gas—well confined and working on the rock. ROCKMASTER blasting gives a smooth flow of power that means control over breakage and throw never before possible—with far less noise and vibration!

Your job may call for two, three, or even all sixteen ROCKMASTER milli-second delay electric blasting caps. We help you select them to fit a particular job in quarry, strip pit, mine, construction . . . on the surface or underground. Drill pattern is adjusted to fit the system, often with substantial savings in drilling and dynamite.

Write for free ROCKMASTER "16" booklet which includes diagrams for typical loadings. And remember that our technicians will be glad to assist you in applying ROCKMASTER to your operations.

ROCKMASTER: Reg. U. S. Pat. Off.

# ATLAS

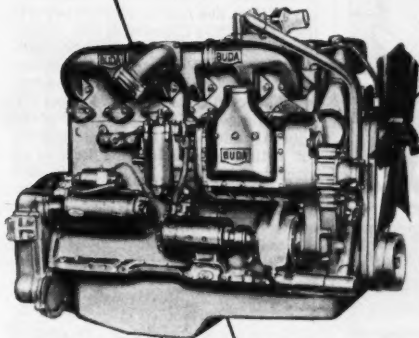
EXPLOSIVES  
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington, Del. • Offices in principal cities • Cable Address—Atpowco

# 14 BUDA SUPER Diesel-Powered "EUCS" Average 16 hrs. per day for 4 Years\* *WITHOUT MAJOR OVERHAULS!*

Buda-Powered Euclid receiving 22 ton load of rock in the pit at Wyandotte Chemical, Alpena, Michigan.



*The Buda 844 Super Diesels powering Wyandotte Chemical Company's 14 Model TD-14 Euclid trucks averaged 17,280 hours of operation over a 4 year period without major overhaul.*



Buda Diesels provide high travel speeds for faster round trips.

Dependability like that, coupled with low operating cost . . . minimum maintenance and less downtime make Buda Diesels a good bet for any operator. Buda Diesels are giving mine operators more horsepower hours per dollar . . . more power . . . greater lugging ability and faster round trips under the toughest job conditions. Ask your nearby Buda Distributor for details on Buda dyna-swirl Diesels' outstanding performance on mine hauls like yours. Write for Bulletins and data today.

*The Buda Company, Harvey, Illinois*

\*Work season—April through November.

BC-12

# BUDA

**a Power-Full  
and Dependable Name  
in Engines**



Manufacturers of Diesel and Gasoline Engines, Railroad Products, Lifting Jacks, Earth Drills and Material Handling Equipment



Heavy-duty lubrication is a *specialty*—not a sideline—in the D-A factory and sales organization. D-A Lubricants and Engine Oils are designed to help you avoid trouble. Ask your local D-A representative for the type and grade recommended by your equipment manufacturers for the conditions under which you operate.

Write today for new D-A folder on current engine lubrication problems and solutions.



**D-A LUBRICANT COMPANY, INC.**  
INDIANAPOLIS 23, INDIANA

*Ready To Rush Construction Jobs*

# Reliance

Ready to ship to your job NOW — RELIANCE Construction equipment offers you important improvements in complete Crushing, Screening, and Washing Plants. Look into the smooth operation and rugged construction of the RELIANCE LINE.

Write for the latest  
RELIANCE Bulletins.

Quality products still available at moderate cost.



## RELIANCE PRODUCTS

Rock Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveyors, Grizzlies, Air Separators, Sand & Gravel Spreaders, Wash Boxes.

**UNIVERSAL ROAD MACHINERY CO.**

Kingston N. Y. U. S. A.

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF U. S. A.

**ARMCO CATALOGS**—Three new catalogs are now available from Armco. Manual RW-8450 describes bin-type retaining walls for embankment stabilization. It features illustrated case histories of typical installations. The second bulletin, entitled "Subgrades Shouldn't Drink," deals with the use of drainage structures in highway construction. The third bulletin is entitled "Why Hire a Wrecking Crew to Install Underground Structures," and deals with the installation of sewers and other underground structures without tearing up pavements.—**ARMCO Drainage & Metal Products, Inc.**, Middletown, Ohio.

**CONCRETE MIXERS**—Printed copies of concrete mixers (construction mixers and pavers) (export classification), Commercial Standard CS164E-50, are now available, reports the Commodity Standards Div., Office of Industry & Commerce, U. S. Dept. of Commerce. Proposed by the Mixer Manufacturers Bureau of the Associated General Contractors of America, Inc., this commercial standard gives general and detailed requirements for tilting and non-tilting mixers in sizes ranging from 3½ to 112 ft, and for 16, 27, and 34-ft paving mixers. The standard covers safety requirements, definitions, and nomenclature of useful terms. Cost of the booklet is 10¢.—**Superintendent of Documents, Government Printing Office, Washington 25, D. C.**

**PHOTOGRAMMETRIC INSTRUMENTS**—Complete line of precision instruments is listed in this catalog. This includes: Stereoscopes, contour finder, height finder, photogrammetric computer, cameras, Sketchmasters, Lazy Daisy triangulator, Rectoblique plotter, Intervalometers, magnetic counters, timer, and related equipment.—**Abrams Instrument Corp.**, 600 E. Shiawassee St., Lansing, Mich.

**BLOCK INSULATION**—Superex block insulation is the subject of a 4-p folder. Featured is a description of the economic advantages of this material and its outstanding properties. Technical data cover conductivity and heat loss and recommended thicknesses. Special shapes are illustrated.—**Johns-Manville**, 22 E. 40th St., New York 16, N. Y.

**ROOF REPAIRS**—Bulletin is designed to assist in determination of exact condition of building roofs and in planning repairs. Form 102-7 contains illustrations of virtually every type of roof damage. It explains how and why roofs deteriorate and indicates trouble spots where the first danger signs appear. Patching and leak-stopping methods are described in detail as are means of resurfacing and renewing old roofs.—**The Monroe Co., Inc.**, 10703 Quebec Ave., Cleveland 6, Ohio.



**SAFETY-STEP LADDERS**—Folder describes all-steel mobile ladders available in models with from 1 to 8 steps for average work levels up to 11 ft 6 in. above the floor. It features a new 4-step Stockart ladder with adjustable push-bar hangers. A special feature of the ladders is that the spring-mounted ball-bearing casters automatically retract when weight is put on the ladder.—**Ballymore Co., Wayne, Pa.**

**LIGHTWEIGHT AGGREGATE**—Brochure (8 pp) describes use of Permalite aggregates in concrete as a lightweight insulating roof fill and

various features of Permalite concrete. Mix designs and other technical data are included, as is a typical specification for roof fill.—**Great Lakes Carbon Corp., Building Product Sales, 18 E. 48th St., New York 17, N. Y.**

**LIGHTWEIGHT CONVEYOR**—Features of a lightweight, multi-purpose conveyor are described in this 4-p bulletin. Eleven features of construction for these conveyors are listed. The conveyors are available in 16- or 20-ft lengths. Dimensions and specifications are included, as is a list of recommended applications.—**The Belt Corp., Orient, Ohio.**



## LARGE OR SMALL

### There's an ELLICOTT Dredge for every job!

#### YOU CAN DEPEND ON ELLICOTT

Since 1885, Ellicott has specialized in designing, engineering and manufacturing hydraulic dredges. Specify Ellicott for assurance that your dredge will be a safe and profitable investment.

Giant dredges to create new harbors and airports . . . medium sized machines for harbors, canals and for producing sand and gravel . . . small dredges for river and lake work . . . portable dredges that can be disassembled . . . only Ellicott produces them all.

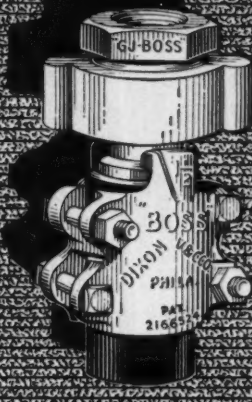
Two examples are the 28-inch "Mindi," shown in the large illustration, and the portable 8-inch Little Dragon® that can be completely disassembled for shipping by truck to inland jobs.

Between the "Mindi" and Little Dragon are Ellicott Dredges of all sizes and capacities, to meet every requirement. Write for our new general catalog No. 825. ELLICOTT MACHINE CORPORATION, 1605 Bush Street, Baltimore 30, Md.



## ELLICOTT DREDGES

## Flawless Quality and Performance



### \*"GJ-BOSS" Ground joint female coupling Style X-34

The original washerless hose coupling . . . product of true perfection in design and construction. Provides unequalled convenience, durability and safety on all high or low pressure lines. Cadmium plated—rustproof.

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.

\*Reg. U. S. Pat. Off.

**DIXON**  
VALVE & COUPLING CO.

Main Office and Factory: PHILADELPHIA 22, PA.  
BRANCHES: CHICAGO, BIRMINGHAM, LOS ANGELES, HOUSTON



## This steel will drill extra footage

It's all Bethlehem Hollow, every bar. But that's not the only reason this drill steel will last longer. The tidy method of storing reconditioned rods indicates good housekeeping and the extra care that assures maximum service life from every bar. It saves time, too.

Drill steel that is handled roughly and thrown about is likely to receive nicks which can provide the starting points for fatigue cracks that shorten its useful life. Likewise, it's unwise to allow steel to remain in acid mine water or, for that matter, to expose it to any kind of abuse or neglect.

You've got fine steel when you use Bethlehem Hollow. It's engineered to give a lot of service. That's why it's smart to give it the care its quality deserves.

**Make sure you've got Bethlehem Hollow on the job. Here's why:**

- ★ Ideal for either forged or detachable bits
- ★ Center hole is smooth, true, and well-centered
- ★ Wide quenching range for easy heat-treating
- ★ Controlled hardenability and grain size
- ★ Made from tough, fatigue-resisting steel

### *For Immediate Delivery*

HOLLOW DRILL STEEL • SOLID DRILL STEEL  
QUARRYING STEELS • AUGER DRILL STEEL  
STONE-DRESSING STEELS

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation  
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## BETHLEHEM HOLLOW DRILL STEEL

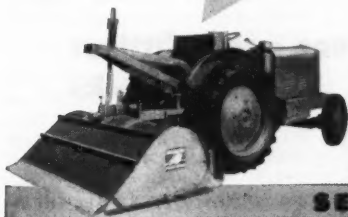




# DO ALL YOUR MIXING WITH THE SEAMAN

The new, 1951 edition of "Soil Stabilization Methods" is off the press. Completely revised and enlarged, 100 pages of pictures, diagrams and practical construction information. It's

**FREE.** Just ask for Bulletin 25. Write today.



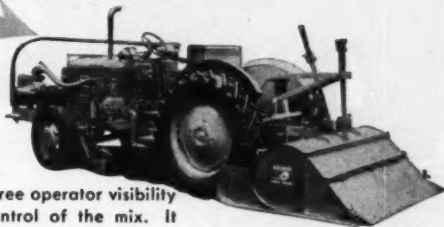
ROAD MIXING with the SEAMAN is the quick, low cost, efficient method. The SEAMAN is engineered and built specifically for that job—just as blades, for example, are built for grading, shoulder work and general maintenance.

The SEAMAN MIXER is designed to mix completely to the bottom of the full selected depth. No unmixed material at the subgrade—and no subgrade material brought up into the mix. Depth control is accurate and positive under all conditions.

And you have complete command of the mix itself at all times. No worries about an unsatisfactory operation even when conditions are adverse, for with the SEAMAN an additional pass to bring the mix up to specification is done quickly and at low cost.

It pays to use the equipment which has been *designed* for its particular job. That's why more and more contractors and highway officials insist that *all* mixing be done with the SEAMAN.

The SEAMAN Self-Propelled (left) is a complete mixing unit which offers full 360 degree operator visibility and accurate control of the mix. It also frees a critical tractor for other work . . .



The SEAMAN TRAV-L-PLANT (right) offers all the advantages of the Self-Propelled unit. It is equipped with tachometer assembly and a volumetric meter is available for the closely controlled application of bitumen. Water also is readily applied.

**SEAMAN MOTORS, INC.**

280 N. 25TH ST.  
MILWAUKEE 3, WIS.

# Rope leads from **UPSON-WALTON**



## Selecting the "lay" of wire rope

● An important characteristic of a wire rope is its *lay*—the relative directions in which wires in the strands, and strands in the rope are twisted.

In *regular lay* rope, the wires in the strands are twisted in the opposite direction to the strands in the rope.

However *lang lay* rope—in which wires and strands are twisted in the same direction—offers several advantages:

- it flexes better
- it has more resistance to abrasion
- it has more resistance to bending fatigue

When choosing *lang lay*, be sure to specify that it be "preformed". An extra operation in the manufacture of Upson-Walton's LAYRITE preformed rope forms the wires and strands in a fixed spiral. This frees each part from internal stress. Years of rugged service have shown that Upson-Walton's LAYRITE wears longer, cuts maintenance costs.

Specify it on your next tough job.

## THE UPSON-WALTON CO.

CLEVELAND, OHIO

NEW YORK • CHICAGO • PITTSBURGH

**wire rope • rope fittings  
• tackle blocks**

**MATCH YOUR WIRE ROPE TO YOUR FITTINGS AND BLOCKS... ONLY UPSON WALTON OFFERS ALL THREE**



## Bechtel Maintenance

(Continued from page 55)

This philosophy has been carried down since way back even before Bechtel was one of the Six Companies on Hoover Dam. Bechtel's work now is predominantly industrial construction although they also do much pipeline work and some heavy construction.

An example of how equipment is handled is shown in disposition of the various rigs required for recent refinery construction in East St. Louis, Ill. At the expiration of this job, all the equipment was sent to local dealer repair shops and put in first-class operating condition. From there it was sent to an industrial job in Cleveland, Ohio, supplemented by some new machines.

After completion of the Cleveland job, all of the equipment was once again completely overhauled. Then part of it was sent back to the St. Louis area for further work, and the remainder sent to a construction job in up-state New York.

In the above example, it is obvious that it would be impractical for Bechtel to maintain any central repair facility to handle their rigs. Further, when a superintendent receives a new or completely overhauled piece of equipment, there can be no kickback from him as to condition or adequacy of the equipment when received. Thus, every job starts out on an equal footing with best chance for a profit.

### Buying Practice Changes

Buying and selling procedure has been altered sharply in recent months. Ordinarily, Bechtel wouldn't keep a piece of equipment more than 2 or 3 years before replacement. Now with increasing shortages, there is much more dependence on dealer repair shops for routine overhaul jobs.

There are still occasions when equipment becomes surplus and is sold at the expiration of a job. Usually, however, the firm has enough new work on the books to keep busy almost all the equipment on hand. When equipment is necessarily kept idle and it is considered too valuable to sell, Bechtel rents storage space near its last use. This storage is usually handled by the dealer who services the equipment.

Of course, each job superintendent is charged with the

## LUBRICATION ECONOMY

# "LUBRIPLATE saved us \$2,098.16 in seven months"



The BROWN COMPANY, Quality Paper Makers of Berlin, New Hampshire, said this in an operating report on one of their Kraft Mill Lime Kilns after changing over from conventional oil lubrication to LUBRIPLATE No. 130AA. Huge savings like this cannot be overlooked. It is worth your while to see what LUBRIPLATE Lubrication can save you.

1. LUBRIPLATE reduces friction and wear
2. LUBRIPLATE prevents rust and corrosion
3. LUBRIPLATE is economical to use

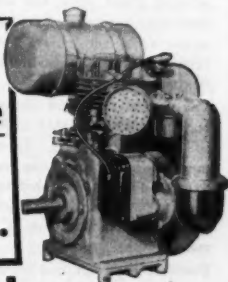
Write today for case histories of savings made through the use of LUBRIPLATE in your industry.

**LUBRIPLATE DIVISION**  
Fiske Brothers Refining Co.  
Newark 5, N.J. Toledo 5, Ohio

*The Different LUBRICANT!*

DEALERS EVERYWHERE, consult your Classified Telephone Book

## Gain More Power Advantage for Your 3 to 6 hp. Units...



Presented here are a few of the basic facts why Wisconsin Heavy-Duty Air-Cooled Engines offer important advantages to the user of power-driven equipment that has to deliver dependable on-the-job service:

1. Rotary type high tension magneto, with impulse coupling, mounted on outside of engine... operates as an entirely independent unit that can be serviced or replaced in a few minutes.
2. Self-cleaning tapered roller bearings at both ends of the crankshaft... will withstand side-pull or end-thrust without danger to bearings.
3. Maximum torque at usable speeds... most desirable on equipment that really has to go to work.

Your Wisconsin Engine distributor or dealer will be glad to co-operate with you in adapting Wisconsin Engines to your requirements. Write for detailed data.

### Condensed Specifications

#### 4-Cycle Single Cylinder

Engines	Model	Model
	ABN	AKN
Bore.....	2 1/8"	2 3/8"
Stroke.....	2 3/8"	2 3/8"
Piston Displ. (Cu. In.).....	13.5	17.8

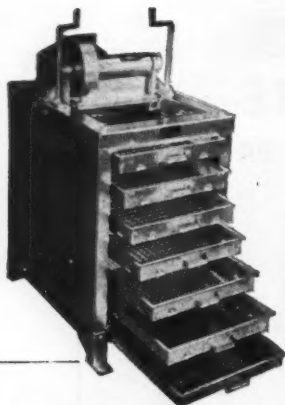
#### HORSEPOWER

1800 R.P.M.....	2.5	3.6
2200 R.P.M.....	3.1	4.5
2600 R.P.M.....	3.7	5.3
3000 R.P.M.....	4.2	5.9
3600 R.P.M.....	4.6	6.2
No. of Piston Rings.....	4	
Fuel Tank Cap.....	1 Gal.	
Weight, lbs.....	Net	Crated
Standard Engine.....	76	89



## WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines  
MILWAUKEE 46, WISCONSIN



REDUCE YOUR COSTS AND  
IMPROVE YOUR PRODUCT  
with  
**GILSON Mechanical  
TESTING SCREEN**

The easiest, quickest and most accurate method for cutting costs is through testing materials on the job.

The GILSON Testing Screen is designed for the efficient sizing of test samples of sand, gravel, stone, slag and similar materials. It accommodates samples up to one cubic foot, making from two to seven separations simultaneously, in five minutes or less.

The screen trays and dust pan are sturdily built to withstand rough usage—will not bend or warp. All trays and pan are balanced to the same tare weight—it is not necessary to transfer samples before weighing. Machine handles coarse or fines from 4" to 200-mesh.

Eliminate guesswork and avoid errors—get the facts—reduce operating delays—cut costs—and meet specifications with a GILSON Mechanical Testing Screen.

SEND COUPON FOR FULL INFORMATION

**GILSON SCREEN CO.**  
BOX 186 MERCER, PENNA.

**GILSON SCREEN CO.**  
BOX 186, MERCER, PENNA.

Please send me bulletin covering details of construction and operation of GILSON TESTING SCREEN.

NAME .....  
COMPANY .....  
CITY ..... ZONE .....  
STATE .....  
C.M.&E.

responsibility of such routine maintenance as greasing and oiling. In some instances these services are also sublet to an equipment dealer.

Usually on industrial jobs, arrangements are made to run the equipment in to the distributor's shops each weekend, or on a set schedule during the week. If, as is frequently the case, the project is an oil refinery job, Bechtel makes sure that the dealer they retain uses the client's petroleum products.

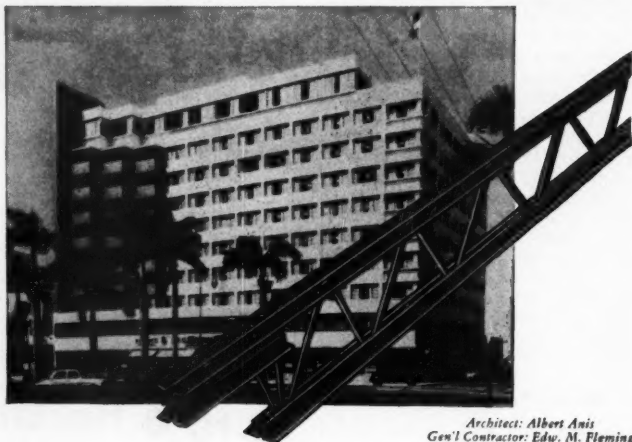
The mechanics of keeping track of the equipment could be monu-

mental. For example, at this writing Bechtel has equipment at work in 14 different states (not including overseas jobs). Each time over-the-road rigs are moved to a new state, new licenses must be obtained.

However, a card record system has been developed so all the facts about a rig are at the fingertips of the head office staff. This is summarized monthly in a confidential report, copies of which are sent to Bechtel top brass. Planning new work is, thus, greatly facilitated.

The equipment department acts as a third party and actually rents

*Beauty* **plus** **STRENGTH**  
with **LACLEDE STEEL JOISTS**



Architect: Albert Anis  
Gen'l Contractor: Edw. M. Fleming,  
Construction Co., Inc.

Combining structural strength with design flexibility, Laclede steel joists played an important role in the construction of this modern new Biscayne Terrace Hotel in Miami, Florida.

Careful control of quality from open hearth to finished product in the modern Laclede mills is your assurance of dependable quality when you specify these Laclede construction steels:

Steel Joists • Welded Wire Fabric • Corrugated Centering • Multi-Rib Round Reinforcing Bars • Accessories  
Spirals • Pipe and Conduit



**LACLEDE STEEL COMPANY**

St. Louis, Mo.

the rigs to each job. Standard AED rates are charged. That's to make the rates comparable with rental from outside sources. In fact, on occasion idle rigs are rented to outside contractors at these same rates.

All of these costs and charges are entered on the record cards, as are also charges for major repairs, giving the staff fingertip info on all rigs.

To aid in working with records of the equipment, all rigs are assigned a classification number and a serial number. To show the diversity of equipment for which records are kept, here are the classes

of equipment appearing on Bechtel's most recent monthly report: 1—sedans; 2—pick-ups; 3—trucks; 4—trailers; 11—tractors; 13—grading equipment; 14—cranes and shovels; 15—ditching machines; 16—concrete equipment; 17—compressors; 24—piledriving equipment; 51—buckets; 52—welding machines; 53—light plants and generators; 54—hoists; 55—tar kettles; 56—pipeline equipment; 57—pumps; 58—mechanical saws; 60—lube equipment; 63—shop equipment; and 64—radios.

Most of the staff in Bechtel's equipment department are ex-

## CUT DITCHING COSTS



**with a BRISCOE DITCHER**

**✓ IT DIGS**  
**✓ IT CLEANS**  
**✓ IT SLOPES**

**E. V. Briscoe & Son:**  
In mark and weed, wire grass and take muck. Flaps and takes ... the Briscoe Ditcher ... with look it all ... with colors flying, we're thoroughly satisfied.

**Clear Lake Water Co.**

**E. V. Briscoe & Son:**  
We own and use 6 Briscoes for cleaning laterals ... which have cut costs for us.  
**Fresno Irrigation District**

**E. V. Briscoe & Son:**  
A most reduction from \$100 a mile to \$10 a mile.  
**Long Canal Co.**

Faster, more complete cleaning jobs plus faster, deeper new ditches with the **Briscoe Ditcher**.

Cuts costs of digging a ditch to as low as \$24 a 1/4 mile! Largest model moves over 500 cubic yards of earth an hour.

**CUTS COST TO 2¢ A CUBIC YARD**

8 separate hydraulic controls give operator push-button action on steering, depth, levelling, tail support, wing angle, and spoil wings. Operates smoothly in water, thick brush, or heavy soil.

Complete demonstration for any Conservation District without obligation.

Write Mel Briscoe  
General Manager  
Dept. D-2

**E. V. BRISCOE & SON KERMAN CALIFORNIA**

**Avoid costly errors with this ...**

**NEW UNIVERSAL Level Transit**



Price, \$185.00+  
complete with tripod



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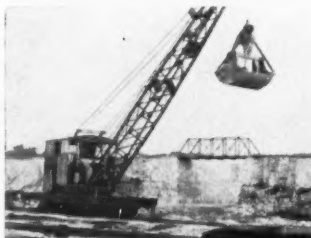
perienced construction hands. Glenn E. (Buck) Buchanan, who heads the department, is a prime example of this. Buck is a graduate engineer (Stanford) who went to work for Bechtel early in his professional career. He has grown with the construction phases of the firm, holding down posts ranging from job engineer to superintendent. He still spends a good deal of time on the job checking on equipment performance and needs.

These needs in terms of requirements for new equipment are transmitted to the San Francisco office for procurement. Bechtel's policy has been to purchase new equipment in the area of use where

possible—sometimes this is not practicable because of the magnitude of the job needs as against the limited facilities of vendors located in the job vicinity. But at least they try to buy locally.

Completing the equipment staff are: Russell Batt, purchasing agent; Dave Jones, S.F. office manager; Col. W. G. Muller, accountant; Lloyd Pfeiffer and Gene Rogers, Western representatives; Tony Valentine and Fred Vallejo, Eastern representatives; Maude Caldera, secretary to Mr. Buchanan, and Misses Hober, Smith and Caspari round out the clerical staff that keeps track of all the equipment.

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Crane converted from steam to diesel engine



Locomotive repowered with diesel engine



Gear Reduction — Pump Application



Crane repowered with modern gas engine

Cranes, Drillers, Locomotives, Shovels, Generators, Pumps — all use Cotta Heavy Duty Reduction Units to adapt output speed of new engine to meet requirements of original equipment ... at remarkably low cost. Use Cotta, too, for transmissions custom-designed for special needs.

Send for COTTA "Engineering Data Manual" illustrating Cotta Reduction Units and Transmissions.

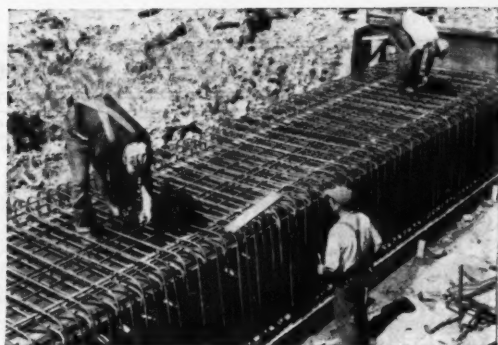


**COTTA**  
HEAVY-DUTY  
REDUCTION UNITS

COTTA TRANSMISSION CO., ROCKFORD, ILLINOIS







Closeup of Bethlehem Reinforcing Bars installed in culvert. The Bethlehem Bar has high, closely spaced lugs to minimize slippage at working loads.

## 8 Miles of Relocation on U.S. 15

Eight miles of U.S. Route 15, between Liverpool and Amity Hall, Pa., was recently relocated under a project authorized by the Pennsylvania Department of Highways. The new 4-lane divided highway is free of sharp curves and steep grades. Its construction included the erection of 12 small bridges or culverts, as well as extensions for two existing structures. Contractor for the project was John H. Swanger, Inc., Lancaster, Pa. Bethlehem furnished bridge reinforcing, dowel units, bar mats and guard rail.

**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

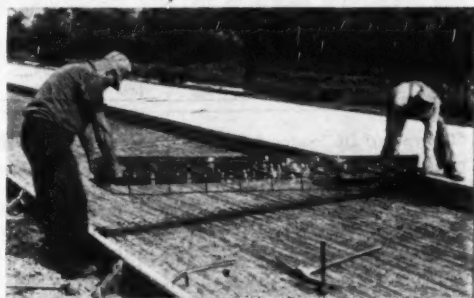
*On the Pacific Coast Bethlehem products are sold by  
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### STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail  
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Drill steel and wire rope get a real workout during early stages of rough grading. Job required about 750,000 cu yd of excavation and fill.



Two men can handle Bethlehem Dowel Unit with ease. The unit holds dowels in accurate alignment in concrete slabs, both horizontally and vertically.



Bethlehem Dowel Units nest conveniently, take little space at Swanger's batching plant. Assembled units in foreground are ready for installation.

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Only a limited number of these famous make gas-powered, portable saws! Cuts lumber up to 4" thick. By adding abrasive blade cuts brick, tile, concrete, steel sheets, TRANSITE pipe, etc. Cost of either the Briggs & Stratton, or Wisconsin 3 1/2 H.P. gas engine alone worth more than the complete sale price. Every saw guaranteed. Terrific bargain. Literature on request. Write, wire or phone 11704 now!

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Pittsboro, N. Dakota

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- 1—D8 Cat SN 1K-3578 Rear Power Double Drum Control Unit
- 1—D7 Cat w T7 Traxxicator 2 1/2 yd. bucket Sn 3T-4249 w #24 rear power control unit
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& EQUIPMENT CO.**

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### WANTED

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## Advertisers in this Issue

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Acker Drill Company	156
Adams Mfg. Co., J. D.	93
Alemite Div., Stewart-Warner Corp.	122
Allied Steel Products Co., Inc.	17
Allis-Chalmers (Tractor Div.)	76
Alloy Rods Co.	161
American Bosch Corp.	113
American Chain & Cable (American Cable Div.)	141
American Hoist & Derrick Co.	130, 167
American Manganese Steel Div.	
American Brake Shoe Co.	117
Atlas Powder Co.	178
Austin, Inc., John	73
Austin Western Co.	163
Baker Mfg. Co., The	100
Baker-Ross, Inc.	124
Baldwin-Lima-Hamilton Corp. (Lima Hamilton Div.)	43
Bay City Shovel, Inc.	106
Beaver Pipe Tools, Inc.	110
Bethlehem Steel Corp.	182, 189
Black & Decker Mfg. Co., The (Home Utility Div.)	23
Blaw-Knox Div., Blaw-Knox Co.	14
Boston Woven Hose & Rubber Co.	88
Briscoe & Son, E. V.	187
Bucyrus-Erie Co.	74, 142, 143
Buda Company	179
Butler Bin Co.	114
Caterpillar Tractor Co.	15
Chain Belt Co. (Const. Machy. Div.)	52
Cities Service Co.	150
Clark Equipment	153
Cleveland Trencher Co.	145
Clipper Mfg. Co.	29
Clyde Iron Works	137
Coffing Hoist Co.	72
Construction Machy. Companies	115
Continental Motors Corp.	88
Cotta Transmission Co.	188
Cummins Engine Co.	138
D-A Lubricant Co., Inc.	180
Dempster Brothers, Inc.	21
Detroit Diesel Engine Div.	
General Motors Corp.	165
Dixon Valve & Coupling Co.	181
Electric Tapper & Equipment Co.	37
Ellicott Machine Corp.	181
Euclid Road Machinery Corp.	7
Farguhar Co., A. B. (Conveyor Division)	92
Flexible Steel Lacing Co.	146
Ford Motor Co. (Ford Div.)	147
Foster Co., L. B.	90
Gallon Iron Works & Mfg. Co., The	108
Gar-Bro Manufacturing Co.	118
General Electric Co.	2nd Cover
General Tire & Rubber Co.	97
Gilson Screen	186
Goodrich Co., The B. F. (Industrial & General Pmts. Div.)	1
(Truck Tire Div.)	4
Goodyear Tire & Rubber Co.	44
Gray Co., The	30, 31
Griffin Wellpoint Co.	188
Haynes Products Co.	190
Heil Co., The	120, 121
Helix Steel Form & Iron Co.	140
Hewitt-Robins, Inc.	174
Hough Co., The Frank G.	116
Hyster Co.	12
Ingersoll-Rand Co.	157
International Harvester Co., Inc. (Industrial Power Div.)	128, 129
(Motor Truck Div.)	26
Iowa Manufacturing Co.	80, 81
Irrington Form & Tank Corp.	130
J. K. Welding Co., Inc.	164
Jackson Mfg. Co.	110
Jaeger Machine Co., The	24, 25
Jahn Trailer Div., Pressed Steel Car Co.	10
Johns-Manville Co.	169
Klevens Corp.	164
Koehring Co.	84, 85

(Continued on page 192)



## ANOTHER BREAK IN THE DIKE!

Tough words to hear when you're battling a river on a rampage. But that's what happened during the recent disastrous floods on the Fraser River in British Columbia.

Perhaps you don't have to keep "rivers caged up," but that's an important job for Fraser River Pile Driving Co., Ltd. and their experience again proves the unusual mobility and handling ease of MICHIGAN cranes.

Says K. A. Matheson of the above company, "In the City of Mission on the Fraser River, the MICHIGAN cranes did a splendid job owing to their mobility and being able to get from one break in the dikes to another in very short order. In particular the TLDT-20 with remote control was a decided advantage, as it enabled us to do the same work with one less man when labor of this sort was badly needed on other flood-fighting work."

Regardless of your type of work, when you need an excavator-crane . . . investigate MICHIGAN . . . you'll agree it's your best buy!

## MICHIGAN POWER SHOVEL COMPANY

495 Second Street, Benton Harbor, Michigan, U. S. A.

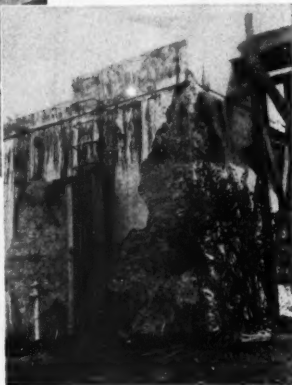
# THOROSEAL

## Restored this Filtration Plant



### BEFORE

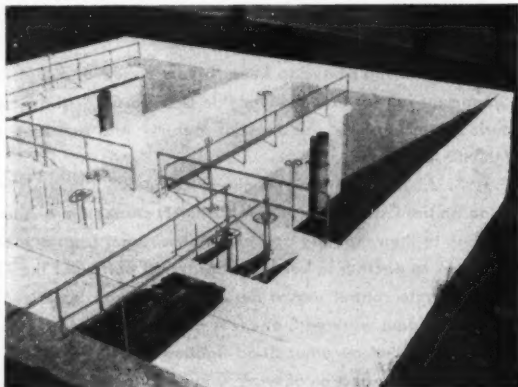
Example of complete break-down of masonry, due to penetration of water into body of concrete and action of frost in damp masonry.



It is amazing how THORO System products will correct a condition, such as shown in photograph. Concrete was sandblasted to remove all disintegrated material to sound concrete surface and reinforcing rods. Patching was done with THORITE Patching Mortar, bringing blistered areas to true and even lines, followed by two applications of WHITE THOROSEAL for protection.

### AFTER

At minimum cost, almost 1/3 the cost of other methods, concrete restoration, patching and surface protection was completed with THORO System products on Filtration Plant in Keyser, West Virginia. Contractor: Standard Construction & Waterproofing Company, of Cumberland, Maryland.



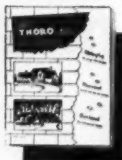
**WATERPLUG**  
To Stop Leaks

**THOROSEAL**  
To Seal Surface

**QUICKSEAL**  
For Beautiful Finish

Our 20-page Brochure describes, in detail, how the THORO System products can benefit you in your construction plan. Send for brochure today, which shows methods of application and how to use the material.

**Standard Dry Wall Products**  
Box X, NEW EAGLE, PENNA.



## Advertisers Index

(Continued from page 191)

Laclede Steel Co.	186
Leece-Neville Co., The	135
LeHol Co. (Cleveland Rock Drill Div.)	28
Leechen & Sons Rope Co., A.	160
Le Tourneau, Inc., R. G.	33, 34, 35, 36
Lincoln Electric Co., The	41
Link-Belt Speeder Co.	39
Lone Star Cement Co.	5
Lubriplate Div., Fiske Bros. Refg. Co.	185
Lucey Boiler & Mfg. Corp.	176
Lufkin Rule Co.	75
Mack Mfg. Co.	16
Macwhyte Co.	3
Madeco Tackle Block Co.	107
Malabary Mfg. Co.	99
Manhattan Rubber Div.	125
Marlow Pumps	2
Marquette Concrete Mfg. Co.	172
Marvel-Schubler Pdt. Div.	146
Borg-Warner Corp.	146
Master Builders Co.	3rd Cover
McCaffrey-Buddock Tagline Corp.	173
McGraw-Hill Book Co.	190
McKiernan-Terry Corp.	170
Michigan Power Shovel	191
Midwestern Engrg. & Equipment Co.	101, 102
Miller Research Engineers	144
Mine Safety Appliances Co.	109
Mixer Mfrs. Bureau	168
Mixermobile Mfrs.	92
Moretrench Corp.	98
Motorola, Inc.	159
Naylor Pipe Co.	71
Northwest Engineering Co.	9
Owen Bucket Co.	151
Paris Mfg. Co.	112
Patent Scaffolding Co., Inc.	10
Raybestos-Manhattan, Inc.	125
(Manhattan Rubber Div.)	125
Rodgers Hydraulic, Inc.	177
Rosco Mfg. Co.	70
Salem Tool Co., The	168
Sanstom Mfg. Co.	188
Schramm, Inc.	182
Seaman Motors, Inc.	183
Shunk Mfg. Co.	170
Sinclair Refg. Co.	154, 155
Southwest Welding & Mfg. Co.	27
(Construction Machy Div.)	27
Standard Dry Wall Pdt.	192
Standard Oil Co. (Indiana)	6
Standard Steel Corp.	132
Standard Steel Works	173
Stang Corp., John W.	124
Stanley Electric Tool Div.	111
Sterling Wheelbarrow Co.	184
Stoody Co.	89
Symons Clamp & Mfg. Co.	4
Talbert Constr. Equip. Co.	193
Templeton, Kenly & Co.	131
Texas Company	18, 19, 166
Thermold Co.	105
Thew Shovel Co.	21
Timken Roller Bearing Co.	69
Traylor Engrg. & Mfg. Co.	171
Union Metal Mfg. Co.	149
Unit Crane & Shovel Corp.	144
Universal Form Clamp Co.	162
Universal Road Machy. Co.	180
Upson-Walton Co., The	184
Viber Co.	119
Vibro-Plus Products, Inc.	176
Victor Equipment Co.	152
Vulcan Iron Works	104
Warner & Swasey Co., The	175
(Gradall Div.)	175
Wellman Co., The S. K.	136
Wellman Engineering Co., The	156
White Company, David	187
White Mfg. Co.	170
Whiteman Mfg. Co.	13
Whitney Chain Div.	158
Whitney-Hanson Ind., Inc.	158
Winslow Engineering Co.	11
Wisconsin Motor Corp.	185
Woodridge Mfg. Co.	20
Worthington Pump & Machy. Co.	4th Cover

## SEARCHLIGHT SECTION

(Classified Advertising)

### Equipment

(Used or Surplus New)	190
For Rent	190
For Sale	190

### Wanted

Equipment	190
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## THE MAN SAID:

"Give me a dump semi-trailer that is interchangeable for use with a 4-wheel or 6-wheel tractor—with maximum axle spacing for legal load limits."

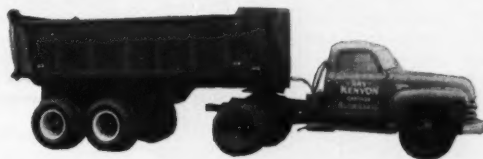
## Then TALBERT developed a new idea in dump semi-trailers:

● We located the twin hoist in the rear of the frame to permit FORWARD ACTION for light-weight, easy, lift—with the force of the hoist action "over the wheels"—and eliminated the heavy forward frame. The frame is drilled so that the tandem can be relocated to get equal load distribution with either a 4-wheel or 6-wheel tractor.

## FIRST WE GAVE THE MAN:

### THE TALBERT STANDARD DUMP SEMI-TRAILER

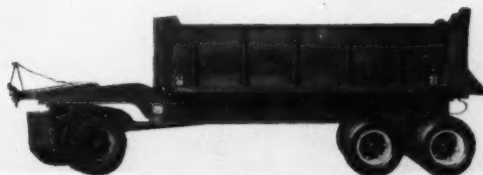
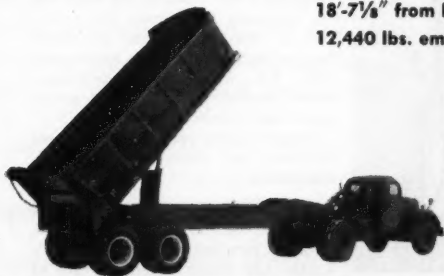
11'-10 $\frac{3}{4}$ " from kingpin to center of lead (first) tandem axle  
11,500 lbs. empty weight



## THEN:

### THE TALBERT EXTENDED DUMP SEMI-TRAILER

(to get the maximum spacing from kingpin to tandem)  
18'-7 $\frac{1}{8}$ " from kingpin to center of lead (first) tandem axle  
12,440 lbs. empty weight



"FORWARD ACTION"



HYDRAULIC DUMP

## ALL TALBERT DUMP SEMI-TRAILERS HAVE:

- "quick coupler" hose connections
- spring tandem suspension
- air brakes—all wheels
- regulation ICC lights
- tubular axles

## TALBERT CONSTRUCTION EQUIPMENT COMPANY

7950 West 47th Street • Lyons (Chicago Suburb), Illinois

# Methods Memo . . .

**OUR OWN ASSOCIATE EDITOR** Jim Connolly takes on new duties as Equipment Editor for both **CONSTRUCTION METHODS AND EQUIPMENT**, and *Engineering News-Record*. In this position, he succeeds Melvin Dean who is retiring to a less-strenuous life in the electrical business. Jim is well-fitted for this assignment. He came to us from Turner Construction Co. after a 5-yr hitch as sergeant in the Corps of Engineers on equipment details.

**ANYONE WHO THINKS** British contractors are behind us in their operations had better take another look at the article on page 60 of this issue describing the maintenance and repair shops of John Laing & Son, Ltd., a big London firm operating throughout the British Empire. Did you ever see a neater shop layout covering 18½ acres?

**MUST READING** for every contractor, equipment man and manufacturer is J. L. Allhand's new book, just off the press, "Tools of the Earthmover—Yesterday and Today". Jim Allhands, veteran partner of Allhands and Briley, Dallas contracting firm that dates way

back to early railroad construction in the Midwest, has done a magnificent job of presenting the history of earthmoving equipment, largely in pictures and patent drawings. He starts out with early man's first hand tools, and ends up with the juggernauts of today. He digs into early patents and first ideas on many lines of equipment. This is Jim's fourth book. The other three deal with early Texas railroad building. The new book contains 435 illustrations, fills 353 large-size pages, and can be obtained for \$5 from the author, J. L. Allhands, 610 Southwestern Life Bldg., Dallas 1, Texas, or from the publishers, The Sam Houston College Press, Huntsville, Tex.

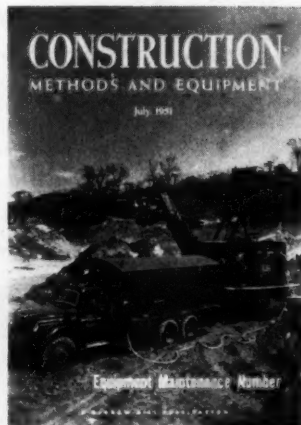
**LOOKS LIKE** General-Shea-Morrison will breeze through their season's schedule of 1,200,000 cu yd of concrete in Hungry Horse Dam, U. S. Bureau of Reclamation's big project on South Fork, Flathead River, in Montana. On June 12 they topped all previous '24-hr pouring records by placing 8,369 cu yd in the dam. That brought the season's total up to 410,000 cu yd despite a late start delayed by weather until April 2.



**INDISPENSABILITY** of planes in construction was clearly demonstrated to ye Ed. recently in visiting Falcon Dam way down on the lower Rio Grande in South Texas. Dale Miller of San Ore Construction Co. flew us down from Oklahoma City in his neat little Ryan Navion. We came back in the Amis company's Cessna. It would have taken a week each way by land transporta-

tion. Incidentally, Falcon Dam is the jumping off place for nowhere.

Here is a picture of Dale Miller standing alongside his Navion just after we landed at the bulldozer-cleared landing strip at the dam. That's Glenn Voeglein, engineer for Amis Construction Co., still in the plane. Coming soon—a description of early operations at Falcon Dam.



## On the Cover . . .

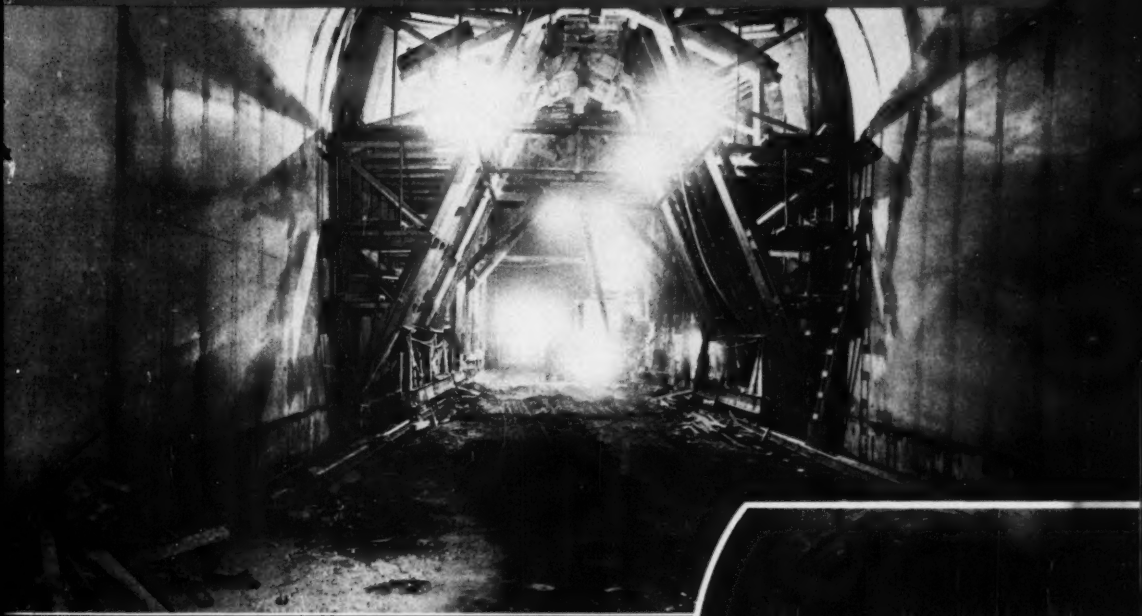
A FITTING FLAG to our special issue devoted entirely to construction equipment maintenance is this beautiful lube truck servicing a Bucyrus-Erie shovel on the George M. Brewster & Son, Inc., New Jersey Turnpike job. This combined lubrication and fueling rig, mounted on a Mack Truck and one of four built by Brewster, was described in detail in **CONSTRUCTION METHODS AND EQUIPMENT** January 1951, page 72.

A roundup of service facilities and equipment this truck carries will give you an idea of its usefulness. An air compressor for inflating big tires and for powering the grease guns; four 250-gal tanks for gasoline and diesel fuel; eight 55-gal tanks for greases and oils; fire extinguishers, anti-freeze tanks; fueling pumps; power grease guns; and supplies storage bins.

Brewster spares no efforts in proper servicing and maintenance of their equipment.

**FAR-SIGHTED** Thew Shovel Co. have contracted with Griffith Trucking Co. to supply men and equipment to Thew's Lorain and Elyria plants in case of disaster. Griffith, put on a retaining basis, will furnish the necessary equipment and manpower to cope with damage done by fire, wind, flood, snow, burst mains or enemy action. The protection plan is integrated with the company police and fire departments for prompt, efficient action. The idea grew out of Thew having to call upon Griffith last winter to dig the plant out from under two heavy snows.

# Better Concrete with **POZZOLITH**



West End of Norfolk & Western's Elkhorn Tunnel, Near Coaldale, W. Va. Started Under Direction Of W. P. Willsie, Chief Engineer, Who Subsequently Retired And Was Succeeded As Chief Engineer By A. B. Stone, Assistant Engineer—B. E. Crumpler, Resident Engineers—C. W. Fiery and Roscoe Porter, General Contractor—Sturm & Dillard Construction Co., Columbus, Ohio; Sub Contractor—Haley, Chisholm & Morris, Charlottesville, Va.

In the construction of this large Norfolk and Western Tunnel the most advanced engineering methods were employed . . . including the use of Pozzolith, cement dispersing, water reducing admixture.

Concrete was pumped into place, Pozzolith giving the mix the proper workability and cohesiveness for easy pumping without segregation. Pozzolith also minimized shrinkage and assured low permeability.

By conforming with the water-cement ratio law, Pozzolith provides the additional benefits of *increased* strength and great durability.

Whatever your concrete requirements, Pozzolith will produce them at lower cost than by any other means.

*Full information on request.*



ABOVE—View Of Interior Of New Elkhorn Tunnel Looking East From West End, Before The Westbound Track Was Laid.

BELOW—View Of East Portal Of Tunnel.



*the*

**MASTER**



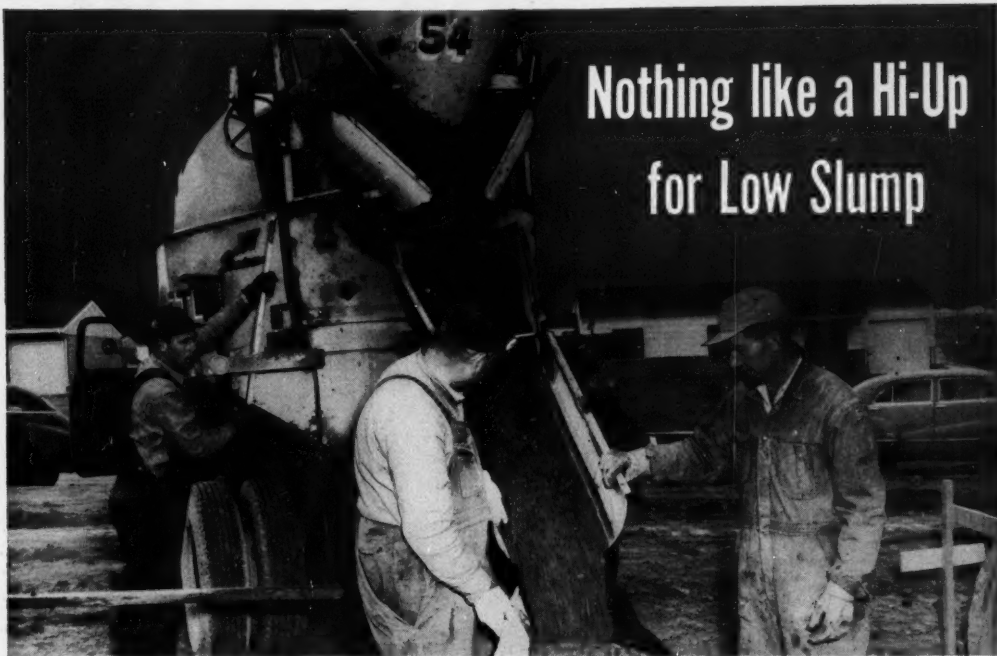
**BUILDERS**



CLEVELAND 3, OHIO

Subsidiary of American-Marietta Company

TORONTO, ONTARIO



**All over the country, Worthington-Ransome Hi-Up Truck Mixers are out-performing other makes!**



Photo of 4½ cu yd Worthington-Ransome Blue Brute Hi-Up Truck Mixer fleet operated by Concrete Inc., Denver, Colorado.



Photo of 5½ cu yd Worthington-Ransome Blue Brute Hi-Up Truck Mixers operated by Lattanzio Transit Mix Co., Inc., Schenectady.

Compare them on the basis of charging and discharging time . . . compare them on the basis of maintenance—

You'll find that Worthington-Ransome Blue Brute Hi-Ups score way ahead of other makes.

You'll surely want to experience results like these—

Fred D. Hoppe, vice-president, Concrete Inc., Denver, says, "Charging and unloading time is the lowest in our fleet of 26 units. We particularly like the way they discharge low and no-slump concrete. We experience less 'down time' with these machines than anything else in our fleet." Mr. Hoppe purchased *six more!*

Lou Lattanzio, Lattanzio Transit Mix, Schenectady, says of his 5½ cu yd Hi-Ups: "We are very pleased with the discharge rate even with low-slump concrete. There has been no appreciable mechanical trouble." Mr. Lattanzio "expects to standardize on Hi-Ups."

So join the growing list of Hi-Up fleets, which include Pine Hill Concrete Mix, Inc., Buffalo—over 40 Hi-Ups; Southern Materials Corp., Richmond and Norfolk—over 20; Buzby Brothers, Westville, New Jersey—over 20; Fenton Materials Co., San Diego—over 20.

**See your nearby Worthington-Ransome distributor for a demonstration.** Worthington Pump and Machinery Corporation, Construction Equipment Division, Dunellen, New Jersey.

**BUY BLUE BRUTES**

**WORTHINGTON**



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**IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB**